SOIL SURVEY OF

Greenville County, South Carolina

United States Department of Agriculture
Soil Conservation Service
In cooperation with
South Carolina Agricultural Experiment Station
and
South Carolina Land Resources Conservation Commission

Major fieldwork for this soil survey was done in the period 1963–1969. Soil names and descriptions were approved in 1972. Unless otherwise indicated, statements in the publication refer to conditions in the county in 1972. This survey was made cooperatively by the Soil Conservation Service, the South Carolina Agricultural Experiment Station, and the South Carolina Land Resources Conservation Commission. It is part of the technical assistance furnished to the Greenville County Soil and Water Conservation District.

Copies of the soil map in this publication can be made by commercial photographers, or they can be purchased from the Cartographic Division, Soil Conservation Service, United States Department of Agriculture, Washington, D.C. 20250.

HOW TO USE THIS SOIL SURVEY

THIS SOIL SURVEY contains information that can be applied in managing farms and woodlands; in selecting sites for roads, ponds, buildings, and other structures; and in judging the suitability of tracts of land for farming, industry, and recreation.

Locating Soils

All the soils of Greenville County are shown on the detailed map at the back of this publication. This map consists of many sheets made from aerial photographs. Each sheet is numbered to correspond with a number on the Index to Map Sheets.

On each sheet of the detailed map, soil areas are outlined and are identified by symbols. All areas marked with the same symbol are the same kind of soil. The soil symbol is inside the area if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Finding and Using Information

The "Guide to Mapping Units" can be used to find information. This guide lists all the soils of the county in alphabetic order by map symbol and gives the capability classification of each. It also shows the page where each soil is described and the woodland group in which the soil has been placed.

Individual colored maps showing the relative suitability or degree of limitation of soils for many specific purposes can be developed by using the soil map and the information in the text. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitation or suitability. For example, soils that have a slight limitation for a given use can be colored green, those with a moderate limitation can be colored yellow, and those with a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils from the soil descriptions and from the discussions of the capability units.

Foresters and others can refer to the section "Use of the Soils for Woodland," where the soils of the county are grouped according to their suitability for trees.

Game managers, sportsmen, and others can find information about soils and wildlife in the section "Use of the Soils for Wildlife Habitat."

Community planners and others can read about soil properties that affect the choice of sites for dwellings, industrial buildings, and recreation areas in the section "Engineering Interpretations of the Soils" and in the section "Use of the Soils for Town and Country Planning."

Engineers and builders can find, under "Engineering Uses of the Soils," tables that contain test data, estimates of soil properties, and information about soil features that affect engineering practices.

Scientists and others can read about how the soils formed and how they are classified in the section "Formation, Morphology, and Classification of the Soils."

Newcomers in Greenville County may be especially interested in the section "General Soil Map," where broad patterns of soils are described. They may also be interested in the information about the county given in the section "Additional Facts about the County."

Cover picture: Pasture, ponds, and pine trees are part of a conservation system on Hiwassee sandy loam, 6 to 10 percent slopes.

Contents

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SOIL SURVEY OF GREENVILLE COUNTY, SOUTH CAROLINA

BY WALLACE J. CAMP, SOIL CONSERVATION SERVICE

FIELDWORK BY H. S. BYRD, R. W. CRAFT, JR., W. H. FLEMING, AND WALLACE J. CAMP, SOIL CONSERVATION SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE IN COOPERATION WITH THE SOUTH CAROLINA AGRICULTURAL EXPERIMENT STATION AND THE SOUTH CAROLINA LAND RESOURCES CONSERVATION COMMISSION

GREENVILLE COUNTY is in the northwestern part of South Carolina (fig. 1). The total area of the county is approximately 789 square miles, or 505,000 acres. Of this area, about 3.4 square miles or 2,180 acres is water, mostly in Saluda Lake and Table Rock Lake. About one-fourth of the county is in the Blue Ridge Mountains; the other three-fourths is in the upper Piedmont Plateau. Greenville, the county seat, is in the central part of the county.

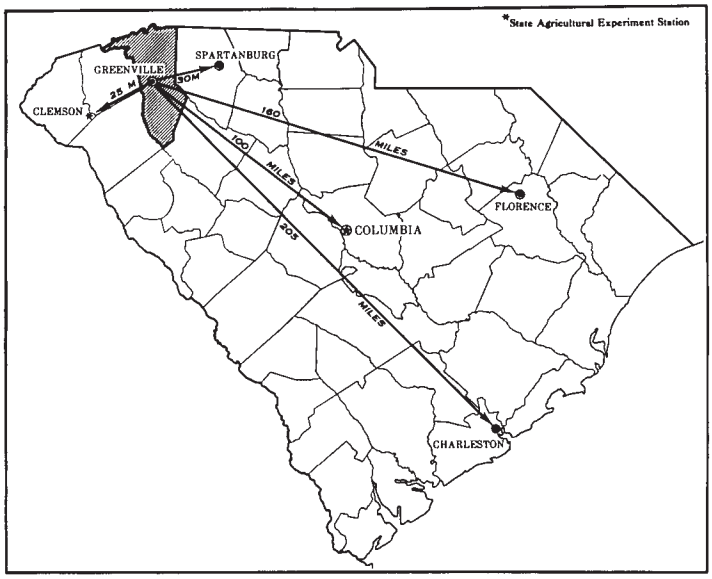

Figure 1.—Location of Greenville County in South Carolina.

The first settlement in Greenville County was made near the City of Greenville in the 1760's. These settlers came from Pennsylvania, Virginia, and North Carolina. Greenville County was created by the South Carolina General Assembly in 1788.

About 68 percent of Greenville County is woodland. The City of Greenville owns about 24,320 acres in the watersheds of Saluda Lake and Table Rock Lake. Pleasant Ridge and Paris Mountains are State parks in Greenville County.

In Greenville County, most of the soils have a loamy surface layer, and a large acreage is suitable for cultivated crops and pasture. The soils most widely used for cultivated crops and pasture are the Appling, Cecil, Durham, Helena, Hiwassee, and Madison soils. The more sloping areas are subject to erosion. The strongly sloping to very steep areas are better suited to woodland.

Most income from the sale of farm products comes from livestock, livestock products, soybeans, cotton, and some truck crops.

The manufacture of textiles, for many years, was the area's only important industry, but in the last century the county has diversified to a variety of new industries.

Streams and ponds are the main sources of water for livestock. Dug or drilled wells furnish water for most rural homes, but some rural homes use commercial water.

The location of Greenville County in the foothills of the Blue Ridge Mountains and its gentle slopes, lakes, and streams make the county an ideal setting for recreation.

How This Survey Was Made

Soil scientists made this survey to learn what kinds of soil are in Greenville County, where they are located, and how they can be used. The soil scientists went into the county knowing they likely would find many soils they had already seen and perhaps some they had not. They observed the steepness, length, and shape of slopes, the size and speed of streams, the kinds of native plants or crops, the kinds of rock, and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material that has not been changed much by leaching or by the action of plant roots.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures. The *soil series* and the *soil phase* are the categories of soil classification most used in a local survey.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Cecil and Hiwassee, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in those characteristics that affect their behavior in the undisturbed landscape.

Soils of one series can differ in texture of the surface layer and in slope, stoniness, or some other characteristic that affects use of the soils by man. On the basis of such differences, a soil series is divided into phases. The name of a soil phase indicates a feature that affects management. For example, Cecil sandy loam, 2 to 6 percent slopes, is one of several phases within the Cecil series.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, trees, and other details that help in drawing boundaries accurately. The soil map at the back of this publication was prepared from aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning the management of farms and fields, a mapping unit is nearly equivalent to a soil phase. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some kind that have been seen within an area that is dominantly of a recognized soil phase.

Some mapping units are made up of soils of different series or of different phases within one series. Three such kinds of mapping units are shown on the soil map of Greenville County: soil complexes, soil associations, and undifferentiated groups.

A soil complex consists of areas of two or more soils, so intricately mixed or so small in size that they cannot be shown separately on the soil map. Each area of a complex contains some of each of the two or more dominant soils, and the pattern and relative proportions are about the same in all areas. Generally, the name of a soil complex consists of the names of the dominant soils, joined by a hyphen. Brevard-Evard complex, 15 to 25 percent slopes, is an example.

A soil association is made up of adjacent soils that occur as areas large enough to be shown individually on the soil map but are shown as one unit because the time and effort of delineating them separately cannot be justified. There is considerable degree of uniformity in pattern and relative extent of the dominant soils, but the soils may differ greatly one from another. The name of an association consists of the names of the dominant soils, joined by a hyphen. Ashe-Cleveland association, very steep, is an example.

An undifferentiated group is made up of two or more soils that could be delineated individually but are shown as one unit because, for the purpose of the soil survey, there is little value in separating them. The pattern and proportion of soils are not uniform. An area shown on the map may be made up of only one of the dominant soils or of two or more. The name of an undifferentiated group consists of the names of the dominant soils, joined by "and." Edneyville and Ashe soils, very steep, is an undifferentiated soil group in this county.

In most areas surveyed, there are places where the soil material is so rocky, so shallow, so severely eroded, or so disturbed by man that it cannot be classified by soil series. These places are shown on the soil map and are described in the survey, but they are called land types and are given descriptive names. Urban land is a land type in Greenville County.

While a soil survey is in progress, soil scientists take soil samples needed for laboratory measurements and for engineering tests. Laboratory data from the same kinds of soil in other places are also assembled. Data on yields of crops under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soil. Yields under defined management are estimated for all the soils.

Soil scientists observe how soils behave when used as a growing place for native and cultivated plants and as material for structures, foundations for structures, or covering for structures. They relate this behavior to properties of the soils. For example, they observe that filter fields for onsite disposal of sewage fail on a given kind of soil, and they relate this to the slow permeability of the soil or to a high water table. They see that streets, road pavements, and foundations for houses are cracked on a named kind of soil and they relate this failure to the high shrink-swell potential of the soil material. Thus, they use observation and knowledge of soil properties, together with available research data, to predict limitations or suitability of soils for present and potential uses.

After data have been collected and tested for the key, or benchmark, soils in a survey area, the soil scientists set up trial groups of soils. They test these groups by further study and by consultation with farmers, agronomists, engineers, and others. They then adjust the groups according to the results of their studies and consultation. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under current methods of use and management.

General Soil Map

The general soil map at the back of this survey shows, in color, the soil associations in Greenville County. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

A map showing soil associations is useful to people who want a general idea of the soils in a county, who want to compare different parts of a county, or who

want to know the location of large tracts that are suitable for a certain kind of land use. Such a map is a useful general guide in managing a watershed, a wooded tract, or a wildlife area or in planning engineering works, recreational facilities, and community developments. It is not a suitable map for planning the management of a farm or field or for selecting the exact location of a road, building, or other structure, because the soils in any one association ordinarily differ in slope, depth, stoniness, drainage, and other characteristics that affect their management.

The general soil map of Greenville County does not precisely join maps in the soil surveys of Laurens, Spartanburg, and Pickens Counties, because of recently acquired knowledge of the new soil classification system. Also, this map was made with more emphasis placed on landscapes to better reflect soil potentials for broad-scale planning.

The soil associations in this survey have been grouped into three general kinds of landscapes for broad interpretative purposes. Each of the broad groups and the soil associations in each group are described in the following pages.

Soils on Flood Plains; Loamy Throughout

These soils formed in loamy alluvial sediment. Deposits of soil material are being continuously laid down by streams during floods. These recent deposits have a fine-textured and medium-textured surface layer that is stratified. There are many scarred and scoured areas that appear to have been old stream channels. In places, the water table is at or near the surface for 6 months or more in most years. In Greenville County, there is only one association that is on the flood plains along the major streams and their tributaries.

1. *Cartecay-Toccoa-Wehadkee association*

Nearly level, well-drained to poorly drained soils

This association consists of soils on flood plains along the Middle and South Tyger Rivers, the North, Middle, and South Saluda Rivers, the Enoree River, the Reedy River, Grove Creek, Mountain Creek, Huff Creek, Brushy Creek, and Green Creek and their tributaries. These soils formed in mostly loamy alluvial sediments washed from soils on uplands. They are flooded frequently for short periods.

This association makes up about 6 percent of Greenville County. Cartecay and similar soils make up about 45 percent of the association. Toccoa and similar soils about 18 percent, Wehadkee soils about 16 percent, and minor soils about 21 percent.

Cartecay soils are in intermediate positions on the flood plains. They have a surface layer of dark-brown sandy loam. Below this are layers of yellowish-brown, reddish-yellow, and yellowish-red silt loam, sandy loam, and loamy sand that are mottled with shades of gray, brown, yellow, and red. Toccoa soils are on the upper reaches of the watershed and in areas adjacent to the stream channels where the banks are deep. They have a surface layer of brown sandy loam. Below this is brown to yellowish-brown, stratified sandy loam. Wehadkee soils are in elongated areas on the flood plains adjacent to the uplands. They have a surface layer of dark-brown silt loam that has grayish-brown mottles. The subsoil is gray loam that has grayish-brown mottles.

Minor soils in this association are in the Buncombe, Chewacla, and Congaree series. Buncombe soils are excessively drained and are in sandy areas along the larger streams. Chewacla soils are somewhat poorly drained and are in the intermediate positions on the flood plains. Congaree soils are well drained and are in the higher positions on the flood plains.

Most of this association is wooded or pastured. The soils are suited to pasture, wetland hardwoods, and as habitat for woodland and wetland wildlife. Woodland products are used for pulpwood, sawtimber, and veneering.

Frequent flooding makes the soils of this association poorly suited for dwellings and to industrial sites or recreational uses.

Soils on Piedmont Uplands; Loamy Surface Layer and Clayey Subsoil

These soils formed in material that weathered from the underlying bedrock of granite, gneiss, or schist. They are dominantly well drained. In Greenville County, there are three associations on the Piedmont uplands.

2. *Cecil-Hiwassee-Appling association*

Dominantly gently sloping to sloping, well-drained soils

This association consists of gently sloping soils on broad ridges and of sloping soils on ridges of medium width that are dissected by a few long, shallow drainageways. These soils are on divides between major watersheds. They formed in material weathered from granite, gneiss, or schist.

This association makes up about 28 percent of Greenville County. Cecil soils make up about 60 percent of the association, Hiwassee soils about 16 percent, Appling soils about 8 percent, and minor soils about 16 percent.

Cecil soils have a surface layer of dark-brown sandy loam. The subsoil is yellowish-red sandy clay loam in the upper part, red clay in the middle part, and red sandy clay loam that has reddish-yellow mottles in the lower part. Hiwassee soils have a surface layer of dark reddish-brown sandy loam and a subsoil of dark-red clay that has reddish-brown mottles in the lower part. Appling soils have a surface layer of dark grayish-brown sandy loam. The subsoil is light yellowish-brown clay in the upper part, yellowish-brown and reddish-yellow clay that has strong-brown and red mottles in the middle part, and mottled brownish-yellow, strong-brown, and red clay in the lower part.

Minor soils in this association are in the Cataula, Durham, Helena, Louisburg, Madison, and Wickham series. Durham and Madison soils are well drained and are in the same drainage positions as the Cecil and Hiwassee soils. Cataula soils also are well drained, but they are moderately deep to a fragipan. Helena

soils are moderately well drained and are in the intermediate drainage positions. Wickham soils are well drained and are on stream terraces. Louisburg soils are excessively drained and are in areas that slope to the Enoree River.

About 80 percent of the acreage in this association is cultivated or in pasture. The rest is woodland or used as homesites. Most farms on this association extend into other associations. Farming generally is carried on by the owner on a part-time basis. Principal crops are soybeans, cotton, corn, oats, and wheat.

Food and cover are well distributed for quail and rabbit (fig. 2). Fall and winter habitat for doves is good. There are sites for dam-type ponds.

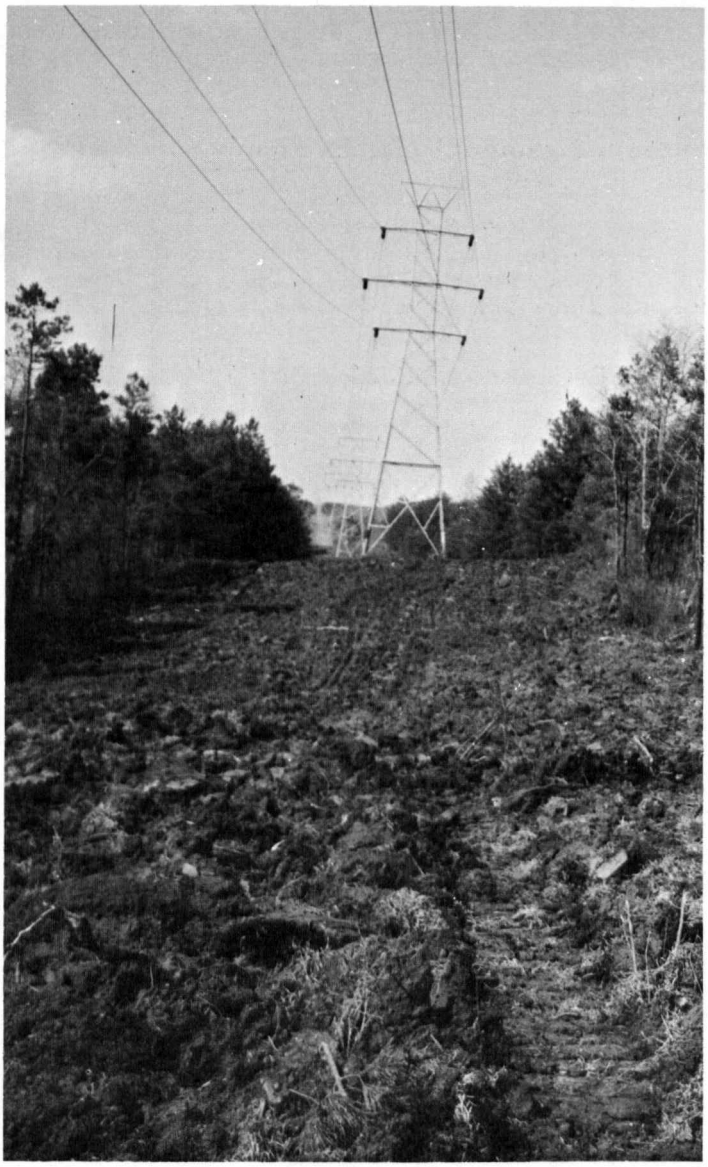

Figure 2.—**Utility company prepares right-of-way on Madison clay loam, 6 to 10 percent slopes, eroded. Planting permanent vegetation controls erosion, furnishes food and cover for wildlife, serves as a firebreak, and provides easy access for service crews.**

Most of the soils in this association are suited to use as sites for dwellings that have onsite sewage disposal and to industrial sites or recreational uses. The Cataula, Helena, and Louisburg soils are less suitable than the other soils.

3. *Cecil-Pacolet association*

Dominantly strongly sloping to moderately steep, well-drained soils

The soils in this association are on narrow ridge crests and adjacent to drainageways and streams. They formed in material weathered from granite, gneiss, or schist.

This association makes up about 31 percent of Greenville County. Cecil soils make up about 49 percent of the association, Pacolet soils about 38 percent, and minor soils about 13 percent.

Cecil soils are deep. They have a surface layer of dark-brown sandy loam. The subsoil is yellowish-red sandy clay loam in the upper part, red clay in the middle part, and red sandy clay loam that has reddish-yellow mottles in the lower part. Pacolet soils are moderately deep. They have a surface layer of brown sandy loam. The subsoil is red clay in the upper part and is red sandy clay that has reddish-yellow mottles in the lower part.

Minor soils in this association are in the Cataula, Helena, Appling, Louisburg, Hiwassee, Madison, and Edneyville series. Appling, Hiwassee, and Madison soils are well drained. Helena soils are moderately well drained and are in the intermediate drainage positions. Louisburg soils are moderately steep and excessively drained, and they are in areas that slope to the Enoree River. Cataula soils are well drained but are moderately deep over a fragipan. Edneyville soils are well drained and are on the steep side slopes adjacent to Paris Mountain.

About 85 percent of this association is in forest or pasture. The rest is cultivated, idle, or used for homesites. Most farms in this association extend into other associations. Farming generally is carried on by the owner on a part-time basis. Soybeans, corn, oats, and wheat are principal crops.

Food and cover are well distributed for quail, rabbit, and squirrel. There are many excellent sites for dam-type ponds or lakes.

Slopes make most of this association poorly suited to septic tanks, industrial sites, or recreational uses.

4. *Cecil-Urban land-Hiwassee association*

Gently sloping to moderately steep, well-drained soils

This association consists of gently sloping to moderately steep soils in the city of Greenville and the surrounding urban and industrial area.

This association makes up about 10 percent of the county. The Cecil soils make up about 35 percent of the association, Urban land about 31 percent, Hiwassee soils about 22 percent, and minor soils about 12 percent.

Cecil soils have a surface layer of dark-brown sandy loam. The subsoil is yellowish-red sandy clay loam in the upper part, red clay in the middle part, and red

sandy clay loam that has reddish-yellow mottles in the lower part. Urban land consists of areas where the soil material is so mixed by having been excavated, filled, or otherwise disturbed that the original soil profile now is unrecognizable. About 85 percent of this land is covered by pavement, industrial plants, houses, and other urban development. Hiwassee soils have a surface layer of dark reddish-brown sandy loam. The subsoil is dark-red clay that has reddish-brown mottles in the lower part.

Minor soils in this association are in the Cartecay, Pacolet, Talladega, and Edneyville series. Cartecay soils are moderately well drained to somewhat poorly drained and are on flood plains. Pacolet soils are well drained, moderately steep, and adjacent to the streams. The steep to very steep Talladega and Edneyville soils are well drained and are adjacent to Paris Mountain.

The only farming in this association is in home gardens where the soil has been severely altered by urban development. Onsite investigation is needed to determine the suitability of the soils for landscaping, woodland, and other uses.

Soils on Mountains; Loamy Throughout

These soils formed in material that weathered from granite, gneiss, or schist rocks. They are dominantly well drained. In Greenville County there are two associations that are on narrow ridges, toe slopes, and very steep side slopes in the mountains and foothills.

5. *Brevard-Evard-Edneyville association*

Dominantly moderately steep to steep, well-drained soils

This association consists of moderately steep to steep soils on narrow ridges and on toe slopes. These soils formed in material weathered from granite, gneiss, or schist and from colluvial material.

This association makes up about 12 percent of Greenville County. Brevard soils make up about 45 percent of the association, Evard soils 30 percent, Edneyville soils 13 percent, and minor soils 12 percent.

Brevard soils have a surface layer of very dark grayish-brown fine sandy loam. The subsoil is reddish-brown sandy clay loam in the upper part and is red sandy clay loam to clay loam in the middle and lower parts. Evard soils have a surface layer of dark-brown sandy loam. The subsoil is yellowish-red to red sandy clay loam. Edneyville soils have a surface layer of very dark grayish-brown fine sandy loam. The subsoil is yellowish-brown to strong-brown sandy clay loam.

Minor soils in this association are in the Cecil, Hiwassee, Talladega, and Saluda series. Cecil soils are well drained and are on the sloping crests of ridges adjacent to the Piedmont section. Hiwassee soils are moderately steep, are well drained, and are adjacent to streams. Talladega soils are well drained and are on the very steep side slopes. Saluda soils are well drained and are on the steep side slopes.

Most of the acreage in this association is wooded. The soils on toe slopes are suited to corn, small grain, and pasture. Soils of the association are suited to woodland wildlife, and some of the soils are suited to openland wildlife.

Steep slopes make most of this association poorly suited to use as sites for dwellings that have onsite sewage disposal and to industrial sites or recreational uses.

6. *Edneyville-Ashe-Cleveland association*

Dominantly steep to very steep, well-drained soils

This association consists of steep to very steep soils in the mountainous part of Greenville County. These soils formed in material weathered from granite, gneiss, or schist rocks.

This association makes up about 13 percent of Greenville County. Edneyville soils make up about 48 percent of the association, Ashe soils 25 percent, Cleveland soils 10 percent, and minor soils 17 percent.

Edneyville soils have a surface layer of very dark grayish-brown fine sandy loam. The subsoil is yellowish-brown to strong-brown sandy clay loam. Ashe soils have a surface layer of very dark grayish-brown and brown sandy loam. The subsoil is dark yellowish-brown sandy loam. Cleveland soils have a surface layer of very dark brown sandy loam. The subsoil is brown sandy loam.

Minor soils in this association are in the Saluda, Brevard, Fannin, and Haywood series. Saluda soils are well drained and are on the very steep side slopes. Brevard soils are well drained and on the steep sides of coves. Fannin soils are well drained and steep. Haywood soils are well drained and moderately well drained and are on the strongly sloping sides of coves and on toe slopes adjacent to the uplands.

Most of this association is in forest. The soils are better suited to this use than to most other uses. Food and cover are well distributed for woodland wildlife.

Most of the soils in this association are unsuited to use as sites for dwellings that have onsite sewage disposal and to industrial sites or recreational uses.

Descriptions of the Soils

This section describes the soil series and mapping units in Greenville County. Each soil series is described in detail, and then, briefly, each mapping unit in that series. Unless it is specifically mentioned otherwise, it is to be assumed that what is stated about the soil series holds true for the mapping units in that series. Thus, to get full information about any one mapping unit, it is necessary to read both the description of the mapping unit and the description of the soil series to which it belongs.

An important part of the description of each soil series is the soil profile, that is, the sequence of layers from the surface downward to rock or other underlying material. Each series contains two descriptions of this profile. The first is brief and in terms familiar to the layman. The second is much more detailed and is for those who need to make thorough and precise studies of soils. The profile described in the series is representative for mapping units in that series. If the

TABLE 1.—*Approximate acreage and proportionate extent of the soils*

Soil	Acres	Percent	Soil	Acres	Percent
Appling sandy loam, 2 to 6 percent slopes	12,100	2.4	Hiwassee sandy loam, 6 to 10 percent slopes	13,700	2.7
Appling sandy loam, 6 to 10 percent slopes	2,500	.5	Hiwassee sandy loam, 10 to 15 percent slopes	6,400	1.3
Ashe-Cleveland association, very steep	8,600	1.7	Hiwassee sandy loam, 15 to 25 percent slopes	1,800	.4
Ashe-Cleveland association, stony, very steep	14,300	2.8	Hiwassee clay loam, 2 to 6 percent slopes, eroded	1,500	.3
Ashe and Cleveland soils, 15 to 40 percent slopes	1,000	.2	Hiwassee clay loam, 6 to 15 percent slopes, eroded	7,000	1.4
Brevard fine sandy loam, 6 to 10 percent slopes	3,800	.7	Louisburg loamy sand, 6 to 15 percent slopes	1,450	.3
Brevard fine sandy loam, 10 to 15 percent slopes	4,900	1.0	Louisburg loamy sand, 15 to 40 percent slopes	1,350	.3
Brevard sandy clay loam, 2 to 10 percent slopes, eroded	850	.2	Madison sandy loam, 2 to 6 percent slopes	3,500	.7
Brevard sandy clay loam, 10 to 25 percent slopes, eroded	1,600	.3	Madison sandy loam, 6 to 10 percent slopes	5,400	1.1
Brevard-Evard complex, 15 to 25 percent slopes	16,500	3.3	Madison sandy loam, 10 to 15 percent slopes	3,200	.6
Buncombe loamy sand, 2 to 5 percent slopes	270	.1	Madison sandy loam, 15 to 25 percent slopes	2,600	.5
Cartecay and Chewacla soils	2,400	.5	Madison clay loam, 6 to 10 percent slopes, eroded	1,950	.4
Cartecay and Toccoa soils	22,000	4.3	Madison clay loam, 10 to 15 percent slopes, eroded	1,200	.2
Cataula sandy loam, 2 to 6 percent slopes, eroded	3,100	.6	Pacolet sandy loam, 15 to 25 percent slopes	43,220	8.6
Cataula sandy loam, 6 to 10 percent slopes, eroded	2,100	.4	Pacolet sandy loam, 25 to 40 percent slopes	6,300	1.3
Cecil sandy loam, 2 to 6 percent slopes	56,400	11.2	Pacolet clay loam, 10 to 15 percent slopes, eroded	7,800	1.5
Cecil sandy loam, 6 to 10 percent slopes	64,000	12.8	Pacolet clay loam, 15 to 25 percent slopes, eroded	1,700	.3
Cecil sandy loam, 10 to 15 percent slopes	30,000	5.9	Pacolet soils, 10 to 25 percent slopes, severely eroded	1,000	.2
Cecil clay loam, 2 to 6 percent slopes, eroded	2,600	.5	Porters loam, 6 to 15 percent slopes	310	.1
Cecil clay loam, 6 to 10 percent slopes, eroded	11,000	2.2	Porters loam, 15 to 40 percent slopes	550	.1
Cecil-Urban land complex, 2 to 10 percent slopes	28,100	5.5	Porters loam, 40 to 70 percent slopes	460	.1
Cecil-Urban land complex, 10 to 25 percent slopes	5,700	1.1	Rock land-Cleveland complex, 25 to 80 percent slopes	800	.1
Chewacla soils	2,500	.5	Saluda and Edneyville soils, 15 to 25 percent slopes	1,000	.2
Congaree fine sandy loam	3,000	.6	Saluda and Edneyville soils, 25 to 40 percent slopes	2,700	.5
Durham loamy sand, 2 to 6 percent slopes	550	.1	Saluda and Edneyville soils, very steep	13,300	2.6
Edneyville fine sandy loam, 6 to 10 percent slopes	1,000	.2	Talladega soils, 40 to 80 percent slopes	2,000	.4
Edneyville fine sandy loam, 10 to 15 percent slopes	1,800	.4	Urban land	1,390	.3
Edneyville fine sandy loam, 15 to 25 percent slopes	5,700	1.1	Wehadkee soils	5,300	1.0
Edneyville soils, 25 to 40 percent slopes	16,200	3.2	Wickham sandy loam, 2 to 6 percent slopes	1,100	.2
Edneyville and Ashe soils, very steep	6,400	1.3	Water (all bodies of water)	2,180	.4
Evard-Brevard association, steep	20,700	4.1	Total	505,000	100.0
Fannin fine sandy loam, 15 to 40 percent slopes	1,200	.2			
Haywood loam, 6 to 15 percent slopes	370	.1			
Helena sandy loam, 2 to 6 percent slopes	1,200	.2			
Hiwassee sandy loam, 2 to 6 percent slopes	8,400	1.7			

profile of a given mapping unit is different from the one described for the series, these differences are stated in describing the mapping unit, or they are differences that are apparent in the name of the mapping unit. Colors and consistence are for moist soils unless otherwise noted.

As mentioned in the section "How This Survey Was Made," not all mapping units are members of a soil series. Urban land, for example, does not belong to a soil series but, nevertheless, is listed in alphabetic order along with the soil series.

Following the name of each mapping unit is a symbol in parentheses. This symbol identifies the mapping unit on the detailed soil map. Listed at the end of each description of a mapping unit is the capability unit and woodland suitability group in which the mapping unit has been placed. The page for the description of each capability unit can be learned by referring to the "Guide to Mapping Units" at the back of this survey.

The acreage and proportionate extent of each mapping unit are shown in table 1. Many of the terms used in describing soils can be found in the Glossary, and more detailed information about the terminology and methods of soil mapping can be obtained from the Soil Survey Manual (*7*).[1]

[1] Italic numbers in parentheses refer to Literature Cited, p. 69.

Appling Series

The Appling series consists of gently sloping to sloping soils that are well drained. These soils formed in material that weathered from granite, gneiss, or schist. The native vegetation is mixed hardwood and pine forest that has an understory of vines, briers, and native grasses.

In a representative profile the surface layer is dark grayish-brown sandy loam about 8 inches thick. The subsoil is about 36 inches thick. In sequence from the top, the subsoil is light yellowish-brown clay about 6 inches thick; yellowish-brown clay, about 6 inches thick, that has reddish-yellow mottles; reddish-yellow clay, 12 inches thick, that has strong-brown and red mottles; and mottled brownish-yellow, strong-brown, and red clay 12 inches thick. The underlying material extends to a depth of 62 inches and is mottled red, yellowish-brown, and gray, weathered gneiss rock.

Permeability is moderate, and the available water capacity is medium.

Representative profile of Appling sandy loam, 2 to 6 percent slopes, in a cultivated field about 500 feet south of the intersection of Secondary State Highway 154 and South Carolina Highway 418 and about 10 feet west of South Carolina Highway 418:

Ap—0 to 8 inches, dark grayish-brown (10YR 4/2) sandy loam; weak, fine, granular structure; very friable;

many fine roots; few angular quartz fragments; medium acid, pH 5.9; abrupt, smooth boundary.

B21t—8 to 14 inches, light yellowish-brown (10YR 6/4) clay; weak, medium, subangular blocky structure; friable; patchy faint clay films on faces of peds; many fine and few medium roots; many small pores; few fine mica flakes; very strongly acid, pH 5.0; gradual, smooth boundary.

B22t—14 to 20 inches, yellowish-brown (10YR 5/8) clay; few, fine, faint, reddish-yellow mottles; moderate, fine and medium, subangular blocky structure; firm; complete distinct clay films on faces of peds; few fine and medium roots; few fine pores; few fine mica flakes; very strongly acid, pH 5.0; gradual, smooth boundary.

B23t—20 to 32 inches, reddish-yellow (7.5YR 6/6) clay; common, fine and medium, distinct, strong-brown (7.5YR 5/6) mottles and common, medium, prominent, red (2.5YR 5/6) mottles; moderate, fine and medium, subangular blocky structure; firm; complete distinct clay films on faces of peds; few fine pores; few fine mica flakes; very strongly acid, pH 4.9; gradual, smooth boundary.

B3t—32 to 44 inches, mottled brownish-yellow (10YR 6/6), strong-brown (7.5YR 5/6), and red (2.5YR 5/6) clay; weak, medium, subangular blocky structure; firm; broken faint clay films on faces of peds; common fine mica flakes; very strongly acid, pH 5.0; gradual, wavy boundary.

C—44 to 62 inches, mottled red (2.5YR 4/6), yellowish-brown (10YR 5/4), and gray (10YR 6/1) saprolite of gneiss that crushes to sandy clay loam texture; rock-controlled structure; firm in place; many fine mica flakes; very strongly acid, pH 5.0.

The solum ranges from about 42 to 56 inches in thickness. Depth to hard rock is more than 5 feet. The Ap horizon is medium acid to very strongly acid, and the B2t, B3t, and C horizons are strongly acid or very strongly acid. In areas under hardwood trees, the A1 horizon is very dark gray to very dark grayish brown and is 2 to 3 inches thick. In areas of pine forest, this horizon is dark grayish brown, dark brown, or grayish brown. The A2 horizon is light yellowish brown or pale brown. The Ap horizon is grayish brown, pale brown, dark grayish brown, or brown.

The B1t horizon, where present, is yellowish brown, brownish yellow, yellowish red, or light yellowish brown. The B2t horizon is yellowish brown, brownish yellow, strong brown, or yellowish red and has mottles of red, brown, or yellow. The B2t horizon is clay loam, sandy clay, or clay. The C horizon is weathered granite, gneiss, or schist. It is mottled in shades of red, brown, yellow, or gray. When crushed, the C horizon is loam, clay loam, or sandy clay loam.

Appling soils are associated with Cecil, Durham, Helena, and Louisburg soils. They are not so red in the subsoil as the Cecil soils, and they have a finer textured subsoil than the Durham soils. They are better drained than Helena soils and have a thicker solum than the Louisburg soils.

Appling sandy loam, 2 to 6 percent slopes (ApB).—This soil is on broad ridges. It has the profile described as representative of the series.

Included with this soil in mapping are small areas of Cecil, Durham, Helena, and Hiwassee soils. Also included are small areas where the slope is more than 6 percent and some areas that have a surface layer of loamy sand.

The plow layer of this soil is easily tilled. The main concern of management is controlling erosion. Capability unit IIe–2; woodland suitability group 3o7.

Appling sandy loam, 6 to 10 percent slopes (ApC).—This soil is on sloping ridges and in areas adjacent to drainageways.

Included with this soil in mapping are small areas of Cecil, Hiwassee, and Louisburg soils. Also included are small areas where the slope is less than 6 percent and areas that have a surface layer of loamy sand.

The plow layer of this soil is easily tilled. The main concern of management is controlling erosion. Capability unit IIIe–2; woodland suitability group 3o7.

Ashe Series

The Ashe series consists of moderately steep to very steep soils that are somewhat excessively drained. These soils formed in material that weathered from granite and gneiss. The native vegetation is oak and hickory, as well as a few balsam fir, red spruce, hemlock, and white pine. The understory is laurel, rhododendron, and ferns.

In a representative profile the surface layer is about 7 inches of very dark grayish-brown and brown sandy loam. This layer is overlain by about 2 inches of partly decomposed organic material. The subsoil is dark yellowish-brown sandy loam about 16 inches thick. The underlying material extends to a depth of 35 inches and is yellowish-brown, weathered granite that crushes to sandy loam. Hard granite rock is at a depth of 35 inches.

Permeability is moderately rapid, and the available water capacity is low.

Representative profile of Ashe sandy loam, in an area of the Ashe-Cleveland association, very steep, in a hardwood forest about 510 feet northeast of Corbin Mountain fire tower:

O1—2 inches to 0, partly decomposed organic material.

A11—0 to 3 inches, very dark grayish-brown (10YR 3/2) sandy loam; moderate, medium, granular structure; very friable; many fine roots; many medium and large pores; few medium quartz pebbles; few fine mica flakes; strongly acid, pH 5.2; abrupt, smooth boundary.

A12—3 to 7 inches, brown (10YR 4/3) sandy loam; moderate, medium, granular structure; very friable; many fine roots and common medium roots; common medium pores; few, medium, partly weathered fragments of granite; few fine mica flakes; strongly acid, pH 5.1; clear, smooth boundary.

B2—7 to 23 inches, dark yellowish-brown (10YR 4/4) sandy loam; weak, medium, granular structure; friable; many fine roots and common medium roots; common medium pores; few medium rock fragments; many medium quartz grains; strongly acid, pH 5.2; clear, smooth boundary.

C—23 to 35 inches, yellowish-brown (10YR 5/4), weathered granite material that crushes to sandy loam mixed with highly weathered rock fragments; rock-controlled structure; friable; few medium roots; common fine mica flakes; strongly acid, pH 5.4; abrupt, smooth boundary.

R—35 inches, hard granite rock.

The solum ranges from about 17 to 36 inches in thickness. Depth to hard rock is 2½ feet or more. Reaction is strongly acid or very strongly acid throughout the profile. The A horizon is very dark grayish brown, dark grayish brown, dark brown, or brown. The B horizon is dark yellowish brown, yellowish brown, or brown. It is fine sandy loam, loam, or sandy loam and averages less than 18 percent clay. The C horizon is weathered granite or gneiss rock that crushes to sandy loam. Many fragments of weathered rock are in the C horizon.

Ashe soils are associated with Evard, Edneyville, and Cleveland soils. They have less clay in the subsoil than Evard and Edneyville soils. They have a thicker solum than the Cleveland soils.

Ashe-Cleveland association, very steep (ASG).—This mapping unit is in large wooded areas on the mountains. Slopes range from 40 to 90 percent. The Ashe soils are on long side slopes and are moderately deep. The Cleveland soils have short convex slopes and are shallow. Ashe soils and Cleveland soils in this association have the profile described as representative of their respective series.

The composition of this mapping unit is more variable than that of most other units in the survey area, but it has been controlled well enough to interpret for the anticipated uses of the soils.

Ashe soils make up about 50 percent of most areas mapped as this association, but the range is 40 to 70 percent. Cleveland soils make up about 25 percent of most mapped areas, but the range is 15 to 40 percent. Included with these soils in mapping are areas of Edneyville, Talladega, and Saluda soils and Rock land. Also included are areas where slopes are 15 to 40 percent.

Soils of this association are better suited to forest than to most other uses. A principal concern of management is providing a protective ground cover at all times. Capability unit VIIe–2; woodland suitability group 3r3 for Ashe soils and 4d3 for Cleveland soils.

Ashe-Cleveland association, stony, very steep (ATG).—This mapping unit consists of stony soils in large wooded areas on the mountains. Slopes range from 40 to 90 percent. The moderately deep Ashe soils are on narrow ridge crests and uneven side slopes. The shallow Cleveland soils have uneven convex slopes. Medium-sized to large stones are on the surface of these soils.

The composition of this mapping unit is more variable than that of most other units in the survey area, but it has been controlled well enough to interpret for the anticipated uses of the soils.

The Ashe soils generally make up about 45 percent of mapped areas, but the range is 25 to 65 percent. The Cleveland soils generally make up about 30 percent, but the range is 25 to 75 percent. Included with these soils in mapping are areas of rock outcrop (fig. 3) and of Edneyville and Saluda soils. Also included are small areas of steep soils.

Soils of this association are better suited to forest than to most other uses, but they are poorly suited to the production of merchantable timber. A principal concern of management is providing a protective ground cover at all times. Capability unit VIIe–2; woodland suitability group 3x3 for Ashe soils and 4x3 for Cleveland soils.

Ashe and Cleveland soils, 15 to 40 percent slopes (AvF).—These soils are on narrow ridgetops and uneven side slopes. The Ashe soils are on the narrow ridgetops, and the Cleveland soils are on the uneven side slopes.

Ashe soils commonly make up 35 to 65 percent of the mapping unit, and Cleveland soils make up 15 to 35 percent. Included with these soils in mapping are small areas of Brevard, Evard, Edneyville, Fannin, and Porters soils. Also included are small areas of Cleveland soils that have a surface layer of gravelly or channery loam.

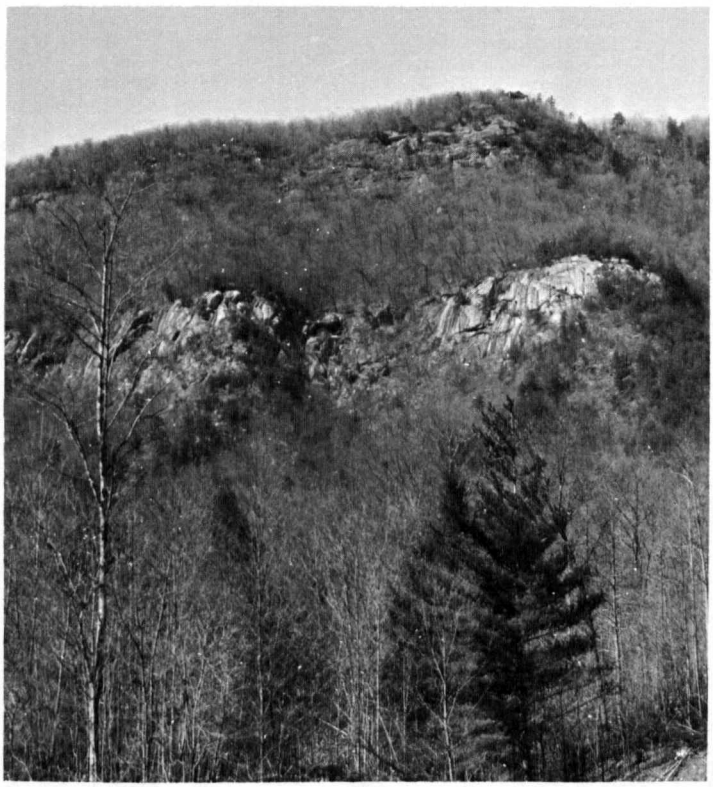

Figure 3.—**Rock outcrops, stones, and boulders are common in areas of the Ashe-Cleveland association, stony, very steep.**

Most areas of this mapping unit are in forest. A principal concern of management is providing a protective cover on the soils at all times. Capability unit VIIe–2; woodland suitability group 3r2 for Ashe soils and 4d3 for Cleveland soils.

Brevard Series

The Brevard series consists of gently sloping to steep soils that are well drained. These soils formed in colluvium that washed or sloughed from soils derived from granite, gneiss, schist, and other rocks. The native vegetation is hardwood forest in which the dominant trees are scarlet, white, and chestnut oaks. The understory is laurel, rhododendron, buckberry, and greenbrier.

In a representative profile the surface layer is very dark grayish-brown fine sandy loam about 2 inches thick. The subsurface layer is 5 inches of yellowish-red fine sandy loam. The subsoil, extending to a depth of 62 inches or more, is 4 inches of reddish-brown sandy clay loam, 13 inches of red sandy clay loam, 12 inches of red clay loam, and 26 inches of yellowish-red sandy clay loam.

Permeability is moderate, and the available water capacity is medium.

Representative profile of Brevard fine sandy loam, 6 to 10 percent slopes, in a wooded area where the slope is 8 percent, about 1 mile northeast of Gap Creek

Church and about 30 feet east of South Carolina Highway 41:

A1—0 to 2 inches, very dark grayish-brown (10YR 3/2) fine sandy loam; moderate, medium, granular structure; very friable; many fine roots; strongly acid, pH 5.3; abrupt, smooth boundary.

A2—2 to 7 inches, yellowish-red (5YR 4/6) fine sandy loam; weak, medium, granular structure; very friable; many fine and common medium roots; strongly acid, pH 5.2; clear, smooth boundary.

B1t—7 to 11 inches, reddish-brown (2.5YR 4/4) sandy clay loam; moderate, medium and coarse, angular blocky structure; friable; thin clay films on faces of peds; many fine roots and few medium roots; many medium pores; strongly acid, pH 5.1; clear, smooth boundary.

B21t—11 to 24 inches, red (2.5YR 4/6) sandy clay loam; moderate, medium and coarse, subangular blocky structure; friable; thin clay films on faces of peds; many fine roots; common fine feldspar crystals; many fine and medium pores; strongly acid, pH 5.2; gradual, smooth boundary.

B22t—24 to 36 inches, red (2.5YR 4/6) clay loam; moderate, medium, subangular blocky structure; friable; clay films on faces of peds; few fine roots; common fine feldspar crystals; few fine pores; strongly acid, pH 5.3; gradual, wavy boundary.

IIB23t—36 to 62 inches, yellowish-red (5YR 4/6) sandy clay loam; weak, angular blocky structure; friable; few, patchy, distinct clay films on faces of peds; few fine roots; many fine feldspar crystals; the upper 3 inches is about 30 percent rounded gravel; strongly acid, pH 5.4.

The solum ranges from about 60 inches to more than 72 inches in thickness. Depth to hard rock commonly is greater than 10 feet. Few to common mica flakes and common to many feldspar crystals are throughout the solum in many places. Lithologic discontinuities, evidenced by stone lines, are at depths of 40 to 72 inches in many places. Reaction is strongly acid or medium acid throughout the profile. The A1 horizon is very dark grayish brown, dark grayish brown, dark reddish brown, dark yellowish brown, or dark brown. The A2 horizon is reddish brown, yellowish red, brown, or pale brown. Where the soil is severely eroded, the surface horizon is yellowish red or red. The A horizon is fine sandy loam or sandy clay loam. The Bt horizons are reddish brown, yellowish red, or red and are sandy clay loam or clay loam. Coarse fragments are common near the lower boundary of the B22t horizon.

Brevard soils are associated with the Evard, Fannin, Cleveland, and Edneyville soils. Brevard soils have a thicker solum than the Evard, Fannin, and Cleveland soils. They occur in a lower part of the landscape than the Evard soils, and they lack the fine mica flakes of the Fannin soils. Brevard soils have a redder subsoil than the Edneyville soils.

Brevard fine sandy loam, 6 to 10 percent slopes (BrC).—This soil is in broad coves and on short toe slopes. It has the profile described as representative of the series.

Included with this soil in mapping are small areas of Fannin and Edneyville soils. Also included are areas where slopes are less than 6 percent or more than 10 percent and small areas that have a surface layer of sandy loam or sandy clay loam.

The plow layer of this soil is easily tilled, except in included areas where the surface layer is sandy clay loam. The main concern of management is controlling erosion. Capability unit IIIe–2; woodland suitability group 2o7.

Brevard fine sandy loam, 10 to 15 percent slopes (BrD).—This soil is in coves and on terraces. Included with it in mapping are small areas of Edneyville, Fannin, and Evard soils. Also included are areas where slopes are 6 to 10 percent and some small areas that have a surface layer of sandy loam or sandy clay loam.

Most of this soil is in hardwood forest. Because it is strongly sloping, the soil is better suited to forest than to most other uses. The main concern of management is controlling erosion. Capability unit IVe–1; woodland suitability group 2o7.

Brevard sandy clay loam, 2 to 10 percent slopes, eroded (BsC2).—This soil has a profile similar to the one described as representative of the series, but the surface layer is red or yellowish-red sandy clay loam. The soil is gently sloping on short toe slopes and is sloping on sharp, irregularly shaped side slopes adjacent to streams. Rills, shallow gullies, and galled areas are common.

Included with this soil in mapping are small areas of Edneyville and Fannin soils. Also included are areas that have a surface layer of sandy loam, fine sandy loam, or clay loam.

Most of this soil has been cleared and cultivated, but much has reverted to forest. Keeping the plow layer in good tilth is difficult. Erosion control is the main concern of management. Capability unit IVe–1; woodland suitability group 2o7.

Brevard sandy clay loam, 10 to 25 percent slopes, eroded (BsE2).—This soil has a profile similar to the one described as representative of the series, but the surface layer is red or yellowish-red sandy clay loam. The soil is on short toe slopes adjacent to streams. Most areas contain gullies and galled areas.

Included with this soil in mapping are small areas of Edneyville, Fannin, and Cleveland soils. Also included are small areas that have a surface layer of fine sandy loam or clay loam. Other inclusions are a few boulders and rock outcrop areas.

Most of the acreage is in forest, to which the soil is better suited than to most other uses. Capability unit VIe–1; woodland suitability group 2r8.

Brevard-Evard complex, 15 to 25 percent slopes (BvE).—The soils in this complex are so intricately mixed that they are mapped as one unit. They are on long, convex side slopes adjacent to areas of sloping Brevard soils, and adjacent to streams. The Brevard soil commonly makes up 45 to 60 percent of the complex, and the Evard soil commonly makes up 35 to 50 percent.

Included with these soils in mapping are small areas of Ashe, Edneyville, Cleveland, and Fannin soils. Also included are areas where slopes are 10 to 15 percent and a few small areas where slopes are 25 to 40 percent. Other inclusions are stony areas, boulders, and rock outcrops.

Most of the acreage of these soils is in forest. Control of erosion is the main concern of management. Capability unit VIe–1; woodland suitability group 2r8 for the Brevard soil and 3r2 for the Evard soil.

Buncombe Series

The Buncombe series consists of gently sloping soils that are excessively drained. These soils formed

in recent alluvium. The native vegetation is birch, elm, sycamore, and pine trees. The understory is vines, shrubs, and briers.

In a representative profile the surface layer is dark brown loamy sand about 8 inches thick. It is overlain by about 1 inch of partly decomposed organic material. The underlying material is about 57 inches thick; the upper 22 inches is yellowish-brown loamy sand, and the lower 35 inches is brownish-yellow sand.

Permeability is rapid, and the available water capacity is low. Buncombe soils are droughty.

Representative profile of Buncombe loamy sand, 2 to 5 percent slopes, in a pine forest about 1½ miles southeast of Wesley Church and 150 feet west of the Enoree River:

O1—1 inch to 0, black (10YR 2/1), decayed organic matter; abrupt, smooth boundary.
A1—0 to 8 inches, dark-brown (10YR 4/3) loamy sand; weak, fine, granular structure; very friable; many fine roots; few coarse sand grains or fine quartz pebbles; strongly acid, pH 5.5; clear, smooth boundary.
C1—8 to 30 inches, yellowish-brown (10YR 5/8) loamy sand; structureless; very friable; many fine roots and common medium roots; few fine mica flakes; medium acid, pH 5.8; gradual, smooth boundary.
C2—30 to 65 inches, brownish-yellow (10YR 6/6) sand; structureless; loose; common fine mica flakes; strongly acid, pH 5.4.

Depth to hard rock is more than 12 feet. Layers of gravel or pebbles are in the substratum in some places. These soils contain few to common fine mica flakes. They are medium acid or strongly acid throughout. The A horizon is dark brown, brown, or dark grayish brown. The C horizon is yellowish brown or brownish yellow; strong-brown mottles are in the lower part in some places. This horizon is loamy sand or sand. Stratification is evident throughout the profile in most areas.

Buncombe soils are associated with Cartecay, Chewacla, Congaree, and Toccoa soils. They differ from these soils in being excessively drained.

Buncombe loamy sand, 2 to 5 percent slopes (BwB).—This soil is on bottom lands along the larger streams.

Included with this soil in mapping are small areas of Cartecay, Chewacla, Congaree, and Toccoa soils. Also included are small areas of soils that have a surface layer of sand or loam and small areas that have recent colluvial deposits.

Most of this soil is in woodland. This soil is easily tilled but is droughty. The principal concerns of management are the control of flooding, droughtiness and leaching, and maintenance of fertility. Capability unit IIIs–2; woodland suitability group 2s8.

Cartecay Series

The Cartecay series consists of nearly level soils that are moderately well drained to somewhat poorly drained. These soils formed in thick, dominantly alluvial sediments. The native vegetation is wetland hardwoods and an understory of vines, grasses, and canes.

In a representative profile the surface layer is dark-brown sandy loam about 7 inches thick. The underlying material is about 49 inches thick. In sequence from the top, the upper 12 inches of the underlying material is yellowish-brown sandy loam that has light brownish-gray and reddish-yellow mottles, the next 9 inches is reddish-yellow silt loam that has yellowish-red and gray mottles, the next 18 inches is yellowish-red loamy sand that has yellowish-brown, pale-brown, and gray mottles, and the lower 10 inches is gray fine sandy loam that has pale-olive mottles.

Permeability is moderately rapid, and the available water capacity is medium.

Representative profile of Cartecay sandy loam, in an area of Cartecay and Toccoa soils, in an improved pasture about 1½ miles south of Standing Springs Church and 175 feet east of county road:

Ap—0 to 7 inches, dark-brown (10YR 4/3) sandy loam; weak, fine, granular structure; very friable; many fine roots; common fine mica flakes; few water-rounded pebbles; medium acid, pH 5.6; abrupt, smooth boundary.
C1—7 to 19 inches, yellowish-brown (10YR 5/6) sandy loam; few, fine, faint, light brownish-gray mottles; root holes are stained with reddish yellow; structureless; very friable; many fine roots; common fine mica flakes; few, fine, water-rounded pebbles; pockets of silty clay material; medium acid, pH 5.9; clear, smooth boundary.
IIC2g—19 to 28 inches, reddish-yellow (7.5YR 6/6) silt loam; few, fine, distinct, yellowish-red and gray mottles; structureless; thin horizontal bedding planes; very friable; many fine mica flakes; strongly acid, pH 5.3; clear, smooth boundary.
IIIC3g—28 to 46 inches, yellowish-red (5YR 4/6) loamy sand; common, fine, distinct, gray (10YR 6/1) mottles and few, fine, distinct, yellowish-brown and pale-brown mottles; structureless; thin horizontal bedding planes; very friable; many fine mica flakes; medium acid, pH 5.6; clear, wavy boundary.
IVC4g—46 to 56 inches, gray (10YR 5/1) fine sandy loam; few, fine, distinct, pale-olive mottles; structureless; very friable; common fine mica flakes; few water-rounded pebbles; strongly acid, pH 5.3.

Reaction is medium acid or strongly acid throughout. Stratification is shown throughout the soil by the presence of thin bedding planes. Mica flakes are few to many in all horizons. The A horizon is very dark grayish brown, dark grayish brown, grayish brown, reddish brown, yellowish brown, dark brown, or brown. It is loam, fine sandy loam, loamy sand, sand, or sandy loam. Recently overwashed areas are gravelly sandy loam or clay loam in places. The upper part of the C horizon is yellowish brown, strong brown, brown, reddish brown, pale brown, brownish gray, or light yellowish brown. Mottles having a chroma of 2 or less are within a depth of 20 inches. The lower part of the C horizon is gray or is mottled gray, yellow, brown, or red. The C horizon is sandy loam, fine sandy loam, loam, loamy sand, sandy clay loam, or silty clay loam. Below a depth of about 40 inches, it is sandy loam, loamy sand, or sand.

The Cartecay soils are associated with the Buncombe, Chewacla, Congaree, Toccoa, and Wehadkee soils. They are not so sandy and so excessively drained as the Buncombe soils. They have less clay between depths of 10 and 40 inches than Chewacla and Congaree soils. Cartecay soils are not so well drained as the Toccoa soils, but they are better drained than the Wehadkee soils.

Cartecay and Chewacla soils (Ca).—The nearly level soils in this mapping unit formed in alluvium on the flood plains along the streams.

Any given area of this unit can be mostly Cartecay soils or mostly Chewacla soils or any combination of the two. Most areas are about 55 percent Cartecay sandy loam and about 25 percent Chewacla silty clay loam. Included with these soils in mapping are small areas of Buncombe, Congaree, Toccoa, or Wehadkee

soils. Also included are small areas that have recent alluvial deposits.

Most areas of this mapping unit are in water-tolerant hardwoods or improved pasture. Tilth is good to fair in most places. The principal concerns of management are drainage, siltation, a high water table, and flooding. Capability unit IIIw–2; woodland suitability group 2w8 for Cartecay soils and 1w8 for Chewacla soils.

Cartecay and Toccoa soils (Cb).—The nearly level soils in this mapping unit are in drainageways and on flood plains. Cartecay soils are on the narrow flood plains along the creeks and branches. The Toccoa soils are mostly in the drainageways and on the uppermost part of the flood plains.

Any areas mapped as this unit can be mostly Cartecay soils or mostly Toccoa soils or any combination of the two. Most areas are about 55 percent Cartecay sandy loam and about 25 percent Toccoa sandy loam. Each of these soils has the profile described as representative of its respective series.

Included with these soils in mapping are small areas of Buncombe, Chewacla, Congaree, and Wehadkee soils. Also included are small areas that have recent colluvial deposits and small wet areas that are shown on the detailed soil map by a symbol for wet spot.

Most areas of this mapping unit are in improved pasture or woodland. Tilth is fair to good in most areas. The principal concerns of management are drainage, siltation, a high water table, and flooding. Capability unit IIIw–2; woodland suitability group 2w8 for Cartecay soils and 1o7 for Toccoa soils.

Cataula Series

The Cataula series consists of gently sloping to sloping soils that are well drained and moderately deep to a fragipan. These soils formed in material that weathered from granite or gneiss. The native vegetation is mixed hardwoods and pines. The understory is vines, briers, and native grasses.

In a representative profile the surface layer is dark-brown sandy loam about 5 inches thick. The subsoil is about 67 inches thick. The upper 22 inches of the subsoil is red clay over a fragipan. The upper 11 inches of the fragipan is red, yellowish-red, and brownish-yellow sandy clay loam. The lower 17 inches of the fragipan is red, yellowish-red, strong-brown, and light-gray sandy clay loam. The lower 17 inches of the subsoil is coarsely mottled red, strong-brown, and light-gray, weathered gneiss that crushes to clay loam.

Permeability is slow, and the available water capacity is medium.

Representative profile of Cataula sandy loam, 2 to 6 percent slopes, eroded, in an improved pasture where the slope is 3½ percent, about 5 miles southwest of Mauldin and 25 feet south of McCall Road:

Ap—0 to 5 inches, dark-brown (10YR 4/3) sandy loam; weak, fine, granular structure; very friable; many fine and few medium roots; few fine quartz pebbles; strongly acid, pH 5.2; abrupt, smooth boundary.

B1t—5 to 7 inches, strong-brown (7.5YR 5/6) sandy clay loam; weak, fine, subangular blocky structure; friable; many fine roots; few fine quartz pebbles; few coarse sand grains; strongly acid, pH 5.2; clear, smooth boundary.

B21t—7 to 21 inches, red (2.5YR 4/6) clay; moderate, medium, angular blocky structure; very firm; clay films in pores and on faces of most peds; common fine and few medium roots; few fine and medium pores; strongly acid, pH 5.2; clear, smooth boundary.

B22t—21 to 27 inches, red (2.5YR 4/6) clay; strong, coarse, angular blocky structure; extremely firm; continuous clay films on faces of peds; few fine roots; few fine pores; strongly acid, pH 5.2; clear, smooth boundary.

Bx1—27 to 38 inches, red (2.5YR 4/6) and yellowish-red (5YR 5/6) sandy clay loam; horizontal layers, ½ to 1½ inches thick, separated by brownish-yellow (10YR 6/6) clay loam layers about ½ inch thick; the brownish-yellow material also extends vertically through the red layers at 6 to 12 inch intervals; moderate, very thick, platy structure that parts to moderate, medium, angular blocky; the red and yellowish-red material is brittle, the brownish-yellow material is firm; continuous clay films on horizontal faces of peds, and patchy clay films on vertical faces of peds; common fine roots along the top of this horizon and a few extend along vertical faces of peds for 2 or 3 inches; strongly acid, pH 5.2; gradual, smooth boundary.

Bx2—38 to 55 inches, red (2.5YR 4/6) and yellowish-red (5YR 4/6) sandy clay loam; horizontal layers, ½ to 2 inches thick separated by strong-brown (7.5YR 5/6) clay loam horizontal layers and broken by vertical streaks of light-gray (N 7/0) clay; weak, thick, platy structure and medium, subangular blocky structure; the red and yellowish-red material is brittle, the strong-brown and gray material is very firm; thin patchy clay films on horizontal faces of peds; strongly acid, pH 5.1; gradual, smooth boundary.

B3t—55 to 72 inches, coarsely mottled red (2.5Y 4/6), strong-brown (7.5YR 5/6), and light gray (10YR 7/1), weathered gneiss that crushes to clay loam; the light-gray mottles are clay and are generally surrounded by strong brown with red on the outer part; massive; firm; fragments of weathered gneiss; strongly acid, pH 5.1.

Depth to the fragipan ranges from about 20 to 34 inches. Depth to hard rock is more than 60 inches. Reaction is medium acid or strongly acid in the A horizon and strongly acid or very strongly acid in the B horizon. The A horizon is dark brown, grayish brown, yellowish brown, or brown. The B1t horizon is yellowish-brown, yellowish-red, or strong-brown sandy loam or sandy clay loam. The B2t horizon is yellowish-brown, brownish-yellow, red, dark-red, or yellowish-red clay or clay loam. The Bx horizon is horizontally streaked with red, brownish yellow, strong brown, and gray. It is sandy clay loam and clay loam. The B3t horizon is coarsely mottled red, strong brown, and light gray. It is clay loam but the gray mottles are clay. The gray mottles are surrounded by other colors.

Cataula soils are associated with Cecil, Hiwassee, and Louisburg soils. They have a fragipan, which is lacking in Cecil and Hiwassee soils. They have a thicker solum than the Louisburg soils.

Cataula sandy loam, 2 to 6 percent slopes, eroded (CdB2).—This soil is on ridges that are narrow or medium in width. It has the profile described as representative of the series. Some areas contain rills and shallow gullies, and 20 to 30 percent of most areas has a surface layer of yellowish-red sandy clay loam.

Included with this soil in mapping are small areas of Cecil and Hiwassee soils and small areas where the

slope is more than 6 percent. Also included are areas that have a surface layer of loamy sand.

Most of the acreage of this soil has been cultivated but is now in pine forest or pasture. Tilth is easily maintained in most areas, but it is difficult to maintain in areas where the surface layer is sandy clay loam or clay loam. The principal concerns of management are controlling erosion and compensating for restricted root growth and water movement. Capability unit IIIe–3; woodland suitability group 3o7.

Cataula sandy loam, 6 to 10 percent slopes, eroded (CdC2).—This soil is on irregularly shaped crests of ridges and side slopes adjacent to drainageways. Rills and shallow gullies are common. In some areas about 20 to 30 percent of this soil has a surface layer of reddish sandy clay loam or clay loam.

Included with this soil in mapping are small areas of Cecil, Hiwassee, and Louisburg soils. Also included are small areas that have a surface layer of loamy sand and small areas where the slope is 2 to 6 percent.

Most of this soil is wooded (fig. 4). Tilth is generally good, but it is only fair where the surface is sandy clay loam or clay loam. The principal concerns of management are controlling erosion and a fragipan which restricts root growth and water movement. Capability unit IVe–2; woodland suitability group 3o7.

Figure 4.—**Properly thinned pines on Cataula sandy loam, 6 to 10 percent slopes, eroded.**

Cecil Series

The Cecil series consists of gently sloping to moderately steep soils that are well drained. These soils formed in material that weathered from granite, gneiss, and schist. The native vegetation is a mixed hardwood and pine forest. The understory is shrubs, briers, and native grasses.

In a representative profile the surface layer is dark-brown sandy loam about 6 inches thick. The subsoil is about 52 inches thick. In sequence from the top, the subsoil is 3 inches of yellowish-red sandy clay loam, 38 inches of red clay, and 11 inches of red sandy clay loam that has reddish-yellow mottles. The underlying material, extending to a depth of 70 inches, is red sandy loam that has yellowish-red and reddish-yellow mottles.

Permeability is moderate, and the available water capacity is medium.

Representative profile of Cecil sandy loam, 2 to 6 percent slopes, about 250 feet from the crest of a side slope having a slope of 4.5 percent in an improved pasture, 0.4 mile east of intersection of Secondary State Highway and South Carolina Highway 418 and about 100 feet north of South Carolina Highway 418:

Ap—0 to 6 inches, dark-brown (10YR 4/3) sandy loam; weak, fine, granular structure; very friable; many fine roots; few fine pores; slightly acid, pH 6.1; abrupt, smooth boundary.

B1t—6 to 9 inches, yellowish-red (5YR 5/6) sandy clay loam; weak, fine, subangular blocky structure; friable; patchy clay films on faces of some peds; many fine roots; many fine pores and old root channels; few coarse sand grains; strongly acid, pH 5.3; clear, smooth boundary.

B21t—9 to 23 inches, red (2.5YR 4/6) clay; moderate, medium, subangular blocky structure; firm; patchy clay films on faces of peds; common fine roots; common fine pores; strongly acid, pH 5.2; gradual, smooth boundary.

B22t—23 to 47 inches, red (2.5YR 4/8) clay; moderate, coarse, subangular blocky structure; firm; continuous clay films on faces of peds; few fine roots; common fine pores; strongly acid, pH 5.3; clear, wavy boundary.

B3t—47 to 58 inches, red (2.5YR 4/8) sandy clay loam; common, fine, distinct, reddish-yellow mottles; weak, fine, subangular blocky structure; firm; few patchy clay films on vertical faces of some peds; few fine feldspar fragments; few fine mica flakes; few medium fragments of gneiss rock; strongly acid, pH 5.2; clear, wavy boundary.

C—58 to 70 inches, red (2.5YR 5/8), weathered gneiss that crushes to sandy loam; common, medium, distinct, yellowish-red (5YR 5/8) mottles and few, fine,

distinct, reddish-yellow streaks or mottles; rock-controlled structure; common fine mica flakes; few fine feldspar fragments; common, medium, partly weathered gneiss; very strongly acid, pH 5.0.

The solum ranges from about 40 to 58 inches in thickness. Depth to hard rock is more than 5 feet. The A horizon is slightly acid to very strongly acid. The B and C horizons are strongly acid or very strongly acid. The surface layer is yellowish brown, dark brown, dark grayish brown, grayish brown, brown, reddish brown, yellowish red, or red. It is sandy loam or clay loam. The B1t horizon is yellowish red or red. The B2t horizon is clay loam or clay. The B2t and B3t horizons have mottles in hues of brown or yellow in some places. The B3t horizon is sandy clay loam or clay loam. The C horizon is commonly red and is mottled with brown, yellow, and white. It is clay loam, loam, or sandy loam.

Cecil soils are associated with Appling, Durham, Helena, Louisburg, and Pacolet soils. They have a redder subsoil than the Appling, Durham, and Helena soils. They are better drained than the Helena soils. They have a thicker solum than the Louisburg and Pacolet soils.

Cecil sandy loam, 2 to 6 percent slopes (CeB).—This soil is on irregularly shaped, broad ridges. It has the profile described as representative of the series.

Included with this soil in mapping are small areas of Appling, Durham, and Helena soils. Also included are small areas that have a surface layer of sandy clay loam or clay loam and small areas where the slope ranges from 6 to 10 percent.

Most of this soil is cultivated or in pasture. Tilth is easily maintained, except in areas that have a clay loam surface layer. The principal concern of management is controlling erosion. Capability unit IIe–1; woodland suitability group 3o7.

Cecil sandy loam, 6 to 10 percent slopes (CeC).—This soil is on ridgetops and in long areas adjacent to drainageways and small streams. There are a few rills and a few shallow gullies.

Included with this soil in mapping are small areas of Appling and Louisburg soils. Also included are small areas where the slope ranges from 2 to 6 percent and from 10 to 15 percent and small areas that have a surface layer of sandy clay loam or clay loam.

Most of this soil is in pasture or is cultivated. Tilth is easily maintained, except in areas that have a clay loam surface layer. The principal concern of management is controlling erosion. Capability unit IIIe–1; woodland suitability group 3o7.

Cecil sandy loam, 10 to 15 percent slopes (CeD).—This soil is on the crests of ridges and in short areas adjacent to small and medium-sized streams. There are rills, a few shallow gullies, and an occasional moderately deep gully.

Included with this soil in mapping are small areas of Louisburg and Pacolet soils. Also included are small areas where the slope ranges from 6 to 10 percent and small areas that have a surface layer of sandy clay loam or clay loam.

Most of this soil is wooded. Tilth is good in most areas, except those that have a clay loam surface layer. The principal concern of management is controlling erosion. Capability unit IVe–1; woodland suitability group 3o7.

Cecil clay loam, 2 to 6 percent slopes, eroded (ClB2).—This soil is on irregularly shaped ridges that are medium in width or broad. It has a profile similar to that described as representative of the series, but the surface layer is yellowish-red clay loam. Galled areas and rills are common.

Included with this soil in mapping are small areas of Appling and Durham soils. Also included are small areas where the slope ranges from 6 to 10 percent, and less eroded areas that have a surface layer of sandy loam.

Most of this soil has been cultivated, but much of the acreage now is in pine forest (fig. 5). The plow layer is difficult to keep in good tilth, and uniform stands of crops are difficult to obtain. Capability unit IIIe–1; woodland suitability group 3o7.

Cecil clay loam, 6 to 10 percent slopes, eroded (ClC2).—This soil is on narrow, irregular crests of ridges and on side slopes of drainageways. It has a profile similar to that described as representative of the series, but the surface layer is 4 inches of yellowish-red clay loam. Small galled areas, rills, and shallow gullies are common.

Included with this soil in mapping are small areas of Appling, Helena, and Louisburg soils. Also included are areas where the slope is 2 to 6 percent and a few small areas that have a surface layer of sandy loam.

Most of this soil has been cultivated, but most of the acreage now has been planted or has reverted to pine forest. Maintaining good tilth in the plow layer is

Figure 5.—**Gasline right-of-way on Cecil clay loam, 2 to 6 percent slopes, eroded. It serves as a road, supplies food for wildlife, and provides a firebreak through a plantation of pines.**

difficult, and uniform stands of crops are difficult to obtain. The principal concern of management is controlling erosion. Capability unit IVe–1; woodland suitability group 3o7.

Cecil-Urban land complex, 2 to 10 percent slopes (CuC).—The soil and land type in this complex are in areas so intricately mixed that they are mapped as one unit. They are in areas within the city limits and suburbs of Greenville.

The Cecil soil makes up about 50 percent of the acreage. Urban land consists of areas that have been excavated, filled, or otherwise disturbed by man. It is made up of variable amounts of sand, silt, and clay. About 85 percent of Urban land is covered by pavement and by industrial, commercial, or residential buildings.

Included with this unit in mapping are small areas of Appling, Madison, and Pacolet soils. Also included are small areas that have a surface layer of loamy sand, loam, sandy clay loam, or clay loam and small areas where the slope ranges from 10 to 15 percent.

This mapping unit is not used for farming. Where the natural soil is exposed or is covered by fill material that formerly was the surface layer, the soil is suited to lawn grasses, trees, and shrubs. Unless there have been drastic alterations, the soils are well suited to use as building sites. Onsite investigation is necessary for industrial construction. The pavement, roofs, and altered soil conditions cause increased runoff and rapid concentration of runoff water. The principal concerns of management are control of runoff, erosion, and siltation. Capability unit not assigned; woodland suitability group 3o7.

Cecil-Urban land complex, 10 to 25 percent slopes (CuE).—This mapping unit is in areas within the city limits and suburbs of Greenville.

The Cecil soil makes up about 50 percent of the acreage. Urban land consists of areas that have been excavated, filled, or otherwise disturbed by man. It is made up of variable amounts of sand, silt, and clay. About 85 percent of Urban land is covered by pavement and by industrial, commercial, or residential buildings.

Included with this unit in mapping are small areas of Madison, Louisburg, and Pacolet soils. Also included are small areas that have a surface layer of loamy sand, sandy clay loam, clay loam, clay, or loam and small areas where the slope is less than 10 percent.

This mapping unit is not used for farming. Where the natural soil is exposed or is covered by fill material that formerly was the surface layer, the soil is suited to lawn grasses, trees, and shrubs. Unless there have been drastic alterations, the soils are well suited to use as sites for buildings. Onsite investigation is necessary for industrial construction. The principal concerns of management are control of runoff, erosion, and siltation (fig. 6). Capability unit not assigned; woodland suitability group 3r8.

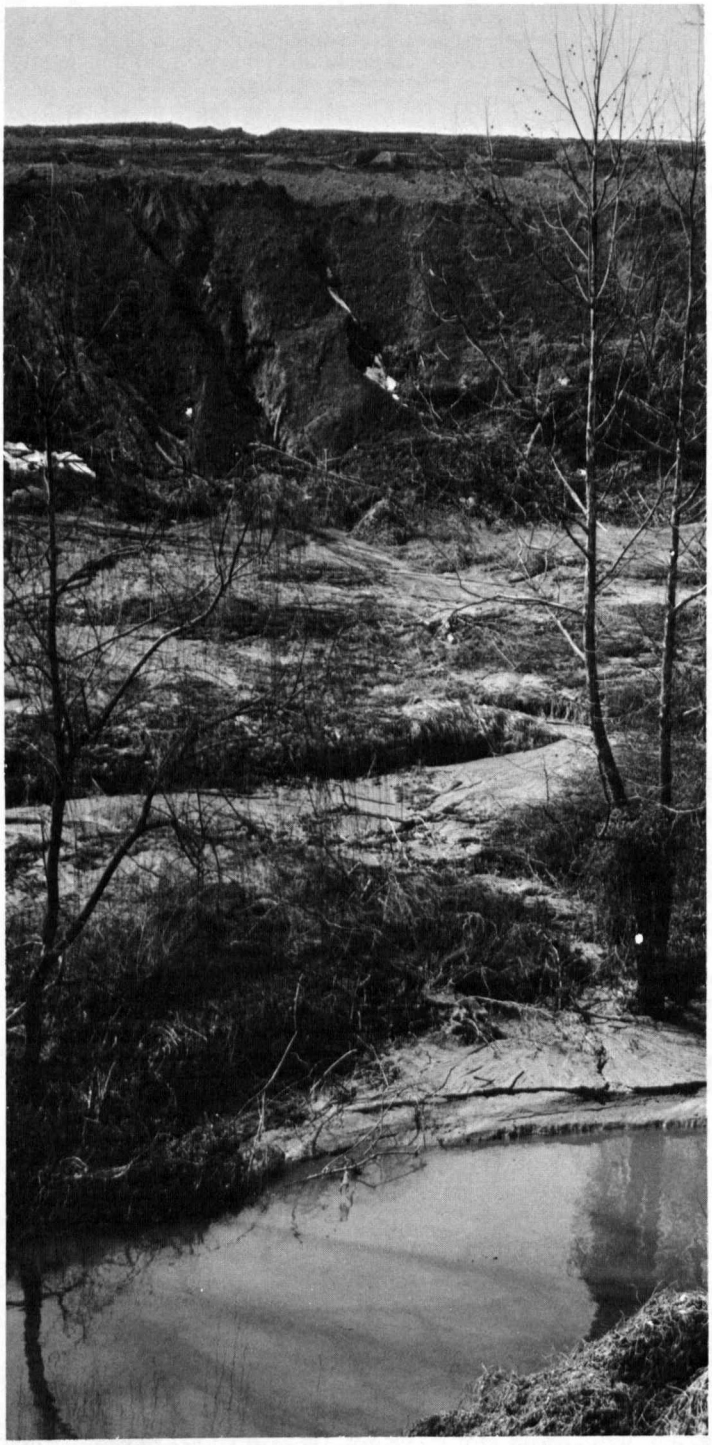

Figure 6.—**Siltation from Cecil-Urban land complex, 10 to 25 percent slopes, is a severe hazard in developing urban areas.**

Chewacla Series

The Chewacla series consists of nearly level soils that are somewhat poorly drained. These soils formed in alluvial sediments that washed from soils formed in residuum from granite, gneiss, schist, and other rocks. The native vegetation is gum, oak, ash, cottonwood, poplar, birch, and sycamore. The understory is reeds, briers, vines, and native grasses.

In a representative profile the surface layer is brown silty clay loam about 7 inches thick. The sub-

soil, extending to a depth of about 52 inches, is 9 inches of brown silty clay loam, 10 inches of brown clay loam that has strong-brown, dark-brown, and dark grayish-brown mottles, 7 inches of dark-gray clay loam that has dark-brown and strong-brown mottles, and 19 inches of grayish-brown fine sandy loam that has dark-brown and strong-brown mottles.

Permeability is moderate, and the available water capacity is high.

Representative profile of Chewacla silty clay loam, in an area of Chewacla soils, in an improved pasture 2 miles south of Marietta:

Ap—0 to 7 inches, brown (10YR 5/3) silty clay loam; weak, fine, granular structure; friable; many fine roots; many fine pores; few fine mica flakes; strongly acid, pH 5.1; abrupt, smooth boundary.

B1—7 to 16 inches, brown (7.5YR 4/4) silty clay loam; weak, medium, subangular blocky structure; friable; many fine roots; many fine pores; few fine mica flakes; strongly acid, pH 5.4; clear, smooth boundary.

B21—16 to 26 inches, brown (10YR 4/3) clay loam; common, medium, distinct, strong-brown (7.5YR 5/6) mottles; few, fine, faint, dark-brown and dark grayish-brown mottles; weak, medium, subangular blocky structure; friable; few fine roots; few fine pores; few fine mica flakes; strongly acid, pH 5.5; gradual, wavy boundary.

B22g—26 to 33 inches, dark-gray (10YR 4/1) clay loam; common, medium, distinct, dark-brown (7.5YR 4/4) and strong-brown (7.5YR 5/6) mottles; weak, medium, subangular blocky structure; friable; few fine roots; few fine pores; few fine mica flakes; strongly acid; pH 5.5; gradual, wavy boundary.

B3g—33 to 52 inches, grayish-brown (10YR 5/2) fine sandy loam; common, medium, distinct, dark-brown (7.5YR 4/4) mottles and common, fine, faint, strong-brown mottles; structureless; friable; few fine pores; common fine mica flakes; medium acid, pH 5.9.

The solum ranges from about 38 to 60 inches in thickness. Depth to hard rock is more than 4 feet. Content of mica flakes ranges from few to common throughout the solum. Reaction is medium acid or strongly acid throughout. The A horizon is generally dark brown, dark grayish brown, dark yellowish brown, or brown. In recently overwashed areas, however, it is reddish brown. This horizon is silty clay loam, silt loam, fine sandy loam, sandy loam, or loam.

The B1 horizon is brown, dark brown, strong brown, dark yellowish brown, or yellowish brown. It is silty clay loam, silt loam, clay loam, or loam. The B2 horizon is dark yellowish brown, yellowish brown, dark brown, or brown in the upper part. Gray mottles are within a depth of 20 inches. Gray increases with increasing depth and is commonly the matrix color in the lower part of the B2 horizon, which is mottled with brown. The B2 horizon is sandy loam, fine sandy loam, silt loam, silty clay loam, or clay loam. The C horizon is stratified sand, silt, and gravel.

The Chewacla soils are associated with the Buncombe, Congaree, Cartecay, Toccoa, and Wehadkee soils. They are neither so sandy nor so excessively drained as Buncombe soils. They are not so well drained as Congaree soils. Chewacla soils are finer textured than Cartecay and Toccoa soils. They are better drained than Wehadkee soils.

Chewacla soils (Cv).—These are nearly level soils on flood plains of medium-sized and large streams. Chewacla silty clay loam and closely similar, well-drained to poorly drained soils characterize the mapping unit. Chewacla silty clay loam has the profile described as representative of the series.

Included with these soils in mapping are small areas of Buncombe, Cartecay, Congaree, Toccoa, and Wehadkee soils. Also included are recently overwashed areas and 1- to 3-acre areas of wet soils in slight depressions. These wet soils are shown on the detailed soil map by the symbol for wet spot.

Most of this mapping unit is in wetland hardwoods and pasture. The fine texture of the soils makes tilth difficult to maintain. The principal concerns of managment are drainage, flooding, and siltation. Capability unit IIIw–2; woodland suitability group 1w8.

Cleveland Series

The Cleveland series consists of moderately steep to very steep soils that are shallow and somewhat excessively drained. These soils formed in material that weathered from granite or gneiss. The native vegetation is hardwoods and an understory of shrubs.

In a representative profile the surface layer is brown sandy loam about 5 inches thick. The subsoil is brown sandy loam that is about 9 inches thick and is underlain by granite rock.

Permeability is moderately rapid, and the available water capacity is low.

Representative profile of Cleveland sandy loam, in an area of the Ashe-Cleveland association, very steep, in a wooded area where the slope is 66 percent, about 20 miles north of Greenville, 400 feet south of secondary State Highway 118, and 3.2 miles northeast of secondary State Highway 42:

A1—0 to 5 inches, very dark brown (10YR 2/2) sandy loam; moderate, medium, granular structure; very friable; common fine mica flakes; common (10 per cent) granitic pebbles 2 to 40 millimeters in size, the larger (20 to 40 millimeters) pebbles are thin and platy; many fine and medium roots; high content of organic matter gives loamy feel; medium acid, pH 5.8; clear, smooth boundary.

B2—5 to 14 inches, brown (7.5YR 4/4) sandy loam; weak, medium, subangular blocky structure; very friable; few fine mica flakes; common (about 15 percent) pebbles and larger, thin, platy pebbles; many medium roots; medium and coarse sand grains coated with fine sand and silt; medium acid, pH 5.8; abrupt, irregular boundary.

R—14 inches, fractured granite rock that has nearly horizontal bedding.

Thickness of the solum and depth to hard granite or gneiss bedrock range from 10 to 20 inches. Coarse pebbles of granite or gneiss make up about 10 to 35 percent, by volume, of all horizons. Reaction is medium acid through very strongly acid throughout. The solum is loam, sandy loam, or fine sandy loam throughout, but in some places there is a thin A horizon of loamy sand. The A horizon is very dark brown, very dark grayish brown, very dark gray, black, or dark grayish brown. The B horizon is brown, yellowish brown, light yellowish brown, dark yellowish brown, or pale brown. Few to common fine mica flakes are in some places. In some areas there is a C horizon less than 6 inches thick.

Cleveland soils are associated with Ashe, Edneyville, and Saluda soils. They are shallower to rock than the Ashe soils. They have less clay in the subsoil than Edneyville and Saluda soils.

In this county the Cleveland soils are mapped only in associations with the Ashe soils and in a complex with Rock land. Descriptions of these mapping units can be found under the headings "Ashe Series" and "Rock land."

Congaree Series

The Congaree series consists of nearly level soils that are well drained. These soils formed in alluvium that washed from soils formed in residuum from granite, gneiss, schist, and other rocks. The native vegetation is oak, hickory, elm, beech, gum, ash, cottonwood, and birch. The understory is canes, brambles, briers, vines, and native grasses.

In a representative profile the surface layer is dark grayish-brown fine sandy loam about 9 inches thick. The underlying material, extending to a depth of 75 inches, is about 18 inches of yellowish-brown sandy clay loam, about 13 inches of yellowish-brown sandy clay loam that has dark-brown mottles, and 35 inches of brownish-yellow sandy clay loam that has brown mottles.

Permeability is moderate, and the available water capacity is medium.

Representative profile of Congaree fine sandy loam in a cultivated field 1 mile south of Piedmont and 2,200 feet west of County Road 52:

Ap—0 to 9 inches, dark grayish-brown (10YR 4/2) fine sandy loam; weak, fine, granular structure; very friable; many fine roots and root holes; few fine mica flakes; medium acid, pH 5.9; abrupt, smooth boundary.

C1—9 to 27 inches, yellowish-brown (10YR 5/6) sandy clay loam; structureless; very friable; many fine roots; many fine pores; few fine mica flakes; medium acid, pH 6.0; gradual, smooth boundary.

C2—27 to 40 inches, yellowish-brown (10YR 5/8) sandy clay loam; few, fine, faint, dark-brown mottles; structureless; friable; common fine mica flakes; medium acid, pH 6.0; gradual, wavy boundary.

C3—40 to 75 inches, brownish-yellow (10YR 6/8) sandy clay loam; few, fine, faint, brown mottles; massive; friable; common fine mica flakes; slightly acid, pH 6.1.

Depth to bedrock is commonly more than 10 feet. The soils are slightly acid through strongly acid throughout. The A horizon is dark yellowish brown, dark grayish brown, dark brown, or brown. The C horizon is yellowish brown, brownish yellow, or strong brown. Brown mottles are at depths below 40 inches. Few to many fine mica flakes are present throughout the profile in many places. Gray mottling is in some places below a depth of 32 inches.

Congaree soils are associated with Buncombe, Cartecay, Chewacla, and Wehadkee soils. They are not so excessively drained as the Buncombe soils. They are better drained than the Cartecay, Chewacla, and Wehadkee soils.

Congaree fine sandy loam (Cw).—This nearly level soil is on flood plains of large streams.

Included with this soil in mapping are small areas of Buncombe, Cartecay, Chewacla, and Wehadkee soils. Also included are areas covered with recent alluvial material 1 to 3 inches thick; some 1- to 2-acre areas of wet soils in slight depressions; and some recently overwashed areas. The wet soils are indicated on the detailed soil map by the symbol for wet spot. Other inclusions are some areas that have a loam or silt loam surface layer.

Most of this soil is in pasture. Tilth is fairly easy to maintain. The principal concerns of management are control of flooding and siltation. Capability unit IIw–2; woodland suitability group 1o7.

Durham Series

The Durham series consists of gently sloping soils that are well drained. These soils formed in material that weathered from granite or gneiss. The native vegetation is mixed hardwood and pine forest. The understory is vines, briers, and native grasses.

In a representative profile the surface layer is olive loamy sand about 8 inches thick. The subsoil, extending to a depth of 48 inches, is 3 inches of light olive-brown sandy loam, 5 inches of brown sandy clay loam, 17 inches of yellow sandy clay loam that has yellowish-brown mottles, and 14 inches of yellow sandy clay that has yellowish-brown and pale-brown mottles. The underlying material, reaching to a depth of 56 inches, is weathered parent material that crushes to clay loam and is mottled yellow, light yellowish brown, and yellowish red.

Permeability is moderate, and the available water capacity is medium.

Representative profile of Durham loamy sand, 2 to 6 percent slopes, in a moist cultivated field where the slope is 3½ percent, 2,000 feet south of U.S. Highway 276 on secondary State Highway 56, near Martin's Crossroads:

Ap—0 to 8 inches, olive (5Y 5/4) loamy sand; weak, fine, granular structure; very friable; many fine roots; few large sand grains; strongly acid, pH 5.5; abrupt, smooth boundary.

B1t—8 to 11 inches, light olive-brown (2.5Y 5/4) sandy loam; weak, fine, subangular blocky structure; very friable; common fine roots; few fine pores; strongly acid, pH 5.5; clear, smooth boundary.

B21t—11 to 16 inches, brown (10YR 5/3) sandy clay loam; moderate, medium, subangular blocky structure; firm; patchy clay films on horizontal faces of peds; few fine roots; strongly acid, pH 5.5; clear, smooth boundary.

B22t—16 to 33 inches, yellow (2.5Y 7/6) sandy clay loam; common, fine, faint, yellowish-brown mottles; moderate, coarse, subangular blocky structure; firm; broken clay films on faces of peds; strongly acid, pH 5.5; gradual, smooth boundary.

B3t—33 to 47 inches, yellow (10YR 7/8) sandy clay; common, medium, faint, light yellowish-brown (2.5Y 6/4) mottles and few, fine, faint, pale-brown mottles; moderate, coarse and medium, subangular blocky structure; firm; patchy clay films on faces of some peds; strongly acid, pH 5.5; gradual, wavy boundary.

C—47 to 56 inches, mottled yellow (10YR 7/8), light yellowish-brown (2.5Y 6/4), and yellowish-red (5YR 5/8), weathered parent material that crushes to clay loam; rock-controlled structure; firm; fragments of weathered granite; few fine mica flakes; strongly acid, pH 5.4.

The solum ranges from about 45 to 57 inches in thickness. Reaction is strongly acid or very strongly acid throughout. The Ap horizon is light brownish gray, grayish brown, or olive. The B1t horizon is light olive brown, brownish yellow, and light yellowish brown. The B21t horizon is brown, yellowish brown, brownish yellow, and reddish yellow. It is sandy clay loam, sandy clay, or clay loam. The B22t horizon is yellow, very pale brown, brownish yellow, and pale brown. It is sandy clay loam, sandy clay, or clay loam. The B3t horizon is yellow, yellowish brown, very pale brown, and pale brown; it is mottled in hues of brown or yellow. This horizon is sandy clay or sandy clay loam. The C horizon is mottled saprolite of weathered granite or gneiss.

Durham soils are associated with Appling, Cecil, and Helena soils. They have a subsoil that is not so fine

textured as the subsoil of the Appling, Cecil, and Helena soils. They are better drained than the Helena soils.

Durham loamy sand, 2 to 6 percent slopes (DuB).—This soil is in irregularly shaped areas at the heads of shallow drainageways and on the sides of wide ridges.

Included with this soil in mapping are small areas of Appling, Cecil, and Helena soils. Also included are some depressional areas where the surface layer is 12 to 16 inches thick and some areas that have a surface layer of sand.

Most of this soil is cultivated or pastured. The very friable plow layer does not clod or crust if it is worked through a medium range of moisture content. It is easy to keep in good tilth. The main concern of management is controlling erosion. Capability unit IIe–2; woodland suitability group 3o7.

Edneyville Series

The Edneyville series consists of sloping to very steep soils that are well drained. These soils formed in material that weathered from granite and gneiss. The native vegetation is chiefly hardwood trees, but there are some white pines and hemlocks. The understory is shrubs, mountain laurel, and rhododendron.

In a representative profile the surface layer is very dark grayish-brown fine sandy loam about 2 inches thick. The subsurface layer is brown fine sandy loam about 5 inches thick. The subsoil is about 27 inches thick. The upper 14 inches of the subsoil is yellowish-brown sandy clay loam, and the lower 13 inches is strong-brown sandy clay loam. The underlying material extends to a depth of 40 inches and is reddish-brown saprolite that crushes to sandy loam.

Permeability is moderate, and the available water capacity is medium.

Representative profile of Edneyville fine sandy loam, 10 to 15 percent slopes, in a forested area where the slope is 14 percent, about 2½ miles southeast of Caesar's Head:

O2—3 inches to 0, loose leaves and partly decomposed organic matter.

A1—0 to 2 inches, very dark grayish-brown (10YR 3/2) fine sandy loam; moderate, medium, granular structure; very friable; many fine roots; many coarse pores; many fine quartz pebbles; very strongly acid, pH 4.6; abrupt, smooth boundary.

A2—2 to 7 inches, brown (10YR 4/3) fine sandy loam; moderate, medium, granular structure; very friable; many fine and medium roots; many coarse pores; many fine quartz pebbles; common, fine, angular rock fragments less than 15 millimeters in size; very strongly acid, pH 4.7; clear, smooth boundary.

B2t—7 to 21 inches, yellowish-brown (10YR 5/6) sandy clay loam; moderate, medium, subangular blocky structure; friable; thin patchy clay films on faces of some peds, in pores, and in root channels; many fine and medium roots; many fine pores; common quartz pebbles; few fine mica flakes; strongly acid, pH 5.3; clear, smooth boundary.

B3t—21 to 34 inches, strong-brown (7.5YR 5/6) sandy clay loam; weak, medium, subangular blocky structure; friable; thin patchy clay films in pores and root channels; few medium roots; many medium and few large pores; few fine mica flakes; common fine quartz pebbles; common rock fragments less than 15 millimeters in size; strongly acid, pH 5.4; gradual, wavy boundary.

C—34 to 40 inches, reddish-brown (5YR 5/4) saprolite of partly weathered gneiss that crushes to sandy loam; rock-controlled structure; many fragments of partly weathered granite or gneiss; common fine mica flakes; strongly acid, pH 5.2.

The solum ranges from 27 to 40 inches in thickness. Reaction is strongly acid or very strongly acid throughout. Few to common mica flakes are throughout the solum. The A1 horizon is very dark grayish brown, dark yellowish brown, very dark brown, or dark brown. The A2 horizon is yellowish brown, strong brown, or brown. It is sandy loam, fine sandy loam, or loam.

The B1t horizon, where present, is yellowish brown, strong brown, or brown. It is sandy clay loam, fine sandy loam, or sandy loam. The B2t horizon is yellowish brown, strong brown, light yellowish brown, or brown. It is sandy clay loam or clay loam. The B3t horizon is strong brown, yellowish brown, reddish yellow, brownish yellow, or brown. It is sandy clay loam or sandy loam. The C horizon is reddish-brown, yellowish-brown, or yellowish-red, partly weathered granite or gneiss rock. It contains many fragments of granite or gneiss too hard to crush.

Edneyville soils are associated with Ashe, Brevard, Evard, Cleveland, and Saluda soils. They have more clay in the subsoil than the Ashe soils. They have a brown subsoil, whereas Brevard and Evard soils have a red subsoil. Edneyville soils have a thicker solum than the Cleveland and Saluda soils.

Edneyville fine sandy loam, 6 to 10 percent slopes (EdC).—This soil is in irregularly shaped areas on ridges and side slopes.

Included with this soil in mapping are small areas of Brevard and Porters soils. Also included are small areas where the slope is 10 to 15 percent and small areas that have a surface layer of sandy loam.

Most of the acreage is in forest. Tilth is fairly easy to maintain in the plow layer. The main concern of management is controlling erosion. Capability unit IIIe–2; woodland suitability group 2o7.

Edneyville fine sandy loam, 10 to 15 percent slopes (EdD).—This soil is on side slopes and ridge crests. It has the profile described as representative of the series.

Included with this soil in mapping are small areas of Ashe, Evard, Fannin, and Porters soils. Also included are small areas where the slope is 6 to 10 percent or 15 to 25 percent and areas that have a surface layer of sandy loam.

Strong slopes make this soil better suited to forest than to most other uses. Tilth is fairly easily maintained in the plow layer. The main concern of management is controlling erosion. Capability unit IVe–1; woodland suitability group 2o7.

Edneyville fine sandy loam, 15 to 25 percent slopes (EdE).—This soil is on ridge crests and side slopes. Included with it in mapping are small areas of Evard, Fannin, and Porters soils. Also included are small areas where the slope is 10 to 15 percent or 25 to 40 percent and small areas that have a surface layer of sandy loam or gravelly sandy loam.

Most of the acreage is wooded. The main concern of management is providing a protective ground cover at all times. Capability unit VIe–1; woodland suitability group 2r8.

Edneyville soils, 25 to 40 percent slopes (EeF).—These soils are on side slopes. They have a profile

similar to the one described as representative of the series, but the surface layer is coarser textured and, in some areas, the subsoil is thinner. Edneyville sandy loam and similar soils that are either thicker or thinner to rock than the Edneyville soil characterize this mapping unit.

Included with these soils in mapping are small areas of Ashe, Cleveland, Evard, and Saluda soils. Also included are small areas of Rock land and small areas where the slope is 15 to 25 percent or 40 to 70 percent.

Most of the acreage is in forest, to which the soils are better suited than to most other uses. The main concern of management is providing a protective ground cover at all times. Capability unit VIIe–2; woodland suitability group 2r8.

Edneyville and Ashe soils, very steep (EHG).—This mapping unit is on long side slopes. Slopes range from 40 to 70 percent. The Edneyville soils are mostly on the middle or lower side slopes, and the Ashe soils are mostly on the upper side slopes.

The composition of this mapping unit is more variable than that of most other units in the survey area, but it has been controlled well enough to interpret for the anticipated uses of the soils.

Edneyville soils make up about 40 to 65 percent of most areas of the unit, and Ashe soils make up about 30 to 55. Included with these soils in mapping are small areas of Cleveland, Porters, Saluda, and Talladega soils and Rock land. Also included are small areas where slopes are 25 to 40 percent and small areas that have a gravelly or stony surface layer.

These soils are suited to forest. The main concern of management is providing a protective ground cover at all times. Capability unit VIIe–2; woodland suitability group 2r9 for Edneyville soils and 3r3 for Ashe soils.

Evard Series

The Evard series consists of moderately steep or steep soils that are well drained. These soils formed in material that weathered from granite or gneiss. The native vegetation is mixed hardwoods, white pines, and shortleaf pines. The understory is shrubs, rhododendron, and mountain laurel.

In a representative profile the surface layer is dark-brown and reddish-brown sandy loam about 5 inches thick. The subsoil is about 29 inches thick. The upper 3 inches of the subsoil is yellowish-red sandy clay loam, and the lower 26 inches is red sandy clay loam. The underlying material, extending to a depth of 55 inches, is yellowish-red, reddish-yellow, pale-brown, and light brownish-gray saprolite.

Permeability is moderate, and the available water capacity is medium.

Representative profile of Evard sandy loam in an area of Evard-Brevard association, steep, in a mixed forest where the slope is 25 percent, about 25 miles north of Greenville, 10 feet west of secondary State Highway 17, and 0.8 mile northeast of U.S. Highway 25:

A1—0 to 2 inches, dark-brown (10YR 3/3) sandy loam; moderate, medium, granular structure; very friable; many fine and medium roots; strongly acid, pH 5.3; abrupt, smooth boundary.

A3—2 to 5 inches, reddish-brown (5YR 4/3) sandy loam; moderate, medium, granular structure; very friable; many fine and medium roots; very strongly acid, pH 5.0; abrupt, smooth boundary.

B21t—5 to 8 inches, yellowish-red (5YR 4/6) sandy clay loam; moderate, medium, subangular blocky structure; firm; thin clay films on faces of most peds; many fine and medium roots; very strongly acid, pH 5.0; clear, smooth boundary.

B22t—8 to 23 inches, red (2.5YR 4/6) sandy clay loam; moderate, medium, subangular blocky and angular blocky structure; firm; thin clay films on faces of most peds; many fine roots; common fine mica flakes; common fine feldspar crystals; few quartz pebbles; strongly acid, pH 5.3; gradual, smooth boundary.

B3t—23 to 34 inches, red (2.5YR 4/6) sandy clay loam; moderate, medium, subangular blocky structure; friable; thin clay films on faces of most peds; few fine roots; common fine mica flakes; common fine feldspar crystals; common, partly weathered, granitic rock fragments; strongly acid, pH 5.5; gradual, smooth boundary.

C—34 to 55 inches, yellowish-red (5YR 4/6), reddish-yellow (5YR 6/6), pale-brown (10YR 6/3), and light brownish-gray (10YR 6/2) saprolite; rock-controlled structure; very friable; sandy loam when crushed; few fine mica flakes; medium acid, pH 5.6.

The solum ranges from about 28 to 40 inches in thickness. Depth to bedrock is more than 4 feet. The A and B horizons are strongly acid or very strongly acid. The C horizon is strongly acid or medium acid. Few to common mica flakes are throughout the profile in most places. Pebbles or cobblestones are on the surface. Fragments of granite rocks are on the surface in some areas.

The A1 horizon is dark grayish brown, dark yellowish brown, or dark brown. It is loam, fine sandy loam, or sandy loam. The A2 horizon, where present, is brown, yellowish brown, or strong brown. It is fine sandy loam, sandy loam, or loam. The A3 horizon, where present, is yellowish red, reddish brown, or strong brown.

The B1t horizon, where present, is yellowish-red, reddish-brown, or red sandy clay loam or clay loam. The B2t horizon is yellowish red or red. It is sandy clay loam or clay loam 12 to 22 inches thick. The B3t horizon is sandy clay loam or sandy loam. The C horizon is weathered granite or gneiss.

Evard soils are associated with Brevard, Edneyville, Ashe, and Cleveland soils. They do not have the thick solum of the Brevard soils. Evard soils have a red subsoil, whereas Edneyville soils have a brown or yellowish subsoil. They have a finer textured subsoil than the Ashe and Cleveland soils.

Evard-Brevard association, steep (EVF).—This mapping unit is in thickly wooded areas on the mountains. Slopes range from 25 to 40 percent. The Evard soils are on narrow ridgetops and irregular side slopes. Brevard soils are on steep, elevated stream terraces, in coves, and on benches.

The composition of this mapping unit is more variable than that of most other units in the survey area, but it has been controlled well enough to allow interpretation for the anticipated uses of the soils.

Evard soils make up about 50 percent of most areas mapped as this association, but the range is 25 to 80 percent. Brevard soils make up about 30 percent of most mapped areas, but the range is 20 to 70 percent. Included with these soils in mapping are small areas of Ashe, Edneyville, Cleveland, and Haywood soils and Rock land. Also included are small areas of colluvial deposits.

Most of the acreage is in forest, to which the soils are better suited than to most other uses (fig. 7). The main concern of management is providing a protective ground cover at all times. Capability unit VIIe–2; woodland suitability group 3r2 for Evard soils and 2r8 for Brevard soils.

Fannin Series

The Fannin series consists of moderately steep or steep soils that are well drained. These soils formed in material that weathered from mica schist. The native vegetation is scarlet oak, chestnut oak, white oak, white pine, and shortleaf pine. The understory is dogwood, laurel, and rhododendron.

In a representative profile the surface layer is very dark grayish-brown fine sandy loam about 2 inches thick. The subsurface layer is reddish-brown fine sandy loam about 3 inches thick. The subsoil is about 28 inches thick. It is yellowish-red fine sandy clay loam in the upper 19 inches and is yellowish-red fine sandy loam in the lower 9 inches. The underlying material, extending to a depth of 48 inches is mottled yellowish-red, red, and yellowish-brown, weathered mica schist rock material.

Permeability is moderate, and the available water capacity is medium.

Representative profile of Fannin fine sandy loam, 15 to 40 percent slopes, in a wooded area where the slope is 32 percent, about 1¼ miles east of the broadcasting tower at Caesar's Head:

O1—2½ inches to ½ inch, oak leaves.
O2—½ inch to 0, matted organic matter, partly decomposed; abrupt, smooth boundary.
A1—0 to 2 inches, very dark grayish-brown (10YR 3/2) fine sandy loam; moderate, medium, granular structure; very friable; many fine roots; many

Figure 7.—**Hardwood forest on Evard-Brevard association, steep.**

coarse pores; many fine mica flakes; few fine quartz grains; strongly acid, pH 5.3; abrupt, smooth boundary.

A2—2 to 5 inches, reddish-brown (5YR 5/4) fine sandy loam; weak, medium, granular structure; very friable; many fine and medium roots; many coarse pores; many fine mica flakes; few thin rock fragments; very strongly acid, pH 4.8; clear, smooth boundary.

B2t—5 to 24 inches, yellowish-red (5YR 4/6) fine sandy clay loam; moderate, medium, subangular blocky structure; friable; thin clay films on faces of some peds; common fine and medium roots; common fine and medium pores; many fine mica flakes; few rock fragments about 15 millimeters in length; very strongly acid, pH 5.0; clear, smooth boundary.

B3t—24 to 33 inches, yellowish-red (5YR 4/6) fine sandy loam; moderate, medium, subangular blocky structure; friable; thin discontinuous clay films on faces of some peds; few medium roots; many medium and large pores; many fine mica flakes; very strongly acid, pH 5.0; gradual, wavy boundary.

C—33 to 48 inches, mottled yellowish-red (5YR 4/6), red (2.5YR 4/6), and yellowish-brown (10YR 5/8), partly weathered mica schist that crushes to fine sandy loam; rock-controlled structure; strongly acid, pH 5.3.

The solum ranges from 24 to 40 inches in thickness. Depth to hard rock is more than 5 feet. Reaction is strongly acid or very strongly acid throughout. Common to many mica flakes are throughout the soil. The A1 horizon is dark grayish brown or very dark grayish brown. The A2 horizon is brown, yellowish brown, or reddish brown. The Bt horizon is yellowish red, reddish brown, or red. The C horizon is yellowish-red, red, brownish-yellow, or yellowish-brown, partly weathered mica schist.

Fannin soils are associated with Brevard, Evard, Haywood, and Cleveland soils. They have more mica in the solum than the Brevard, Evard, and Haywood soils. They have a thicker solum than Cleveland soils.

Fannin fine sandy loam, 15 to 40 percent slopes (FaF).—This soil is on long side slopes. Included with it in mapping are small areas of Brevard, Evard, Haywood, and Cleveland soils. Also included are small areas where slopes are 10 to 15 percent, small areas of rock outcrop, and small areas that have a loam or gravelly surface layer.

Most of the acreage of this soil is in forest, to which it is better suited than to most other uses. The main concern of management is providing a protective ground cover at all times. Capability unit VIIe–2; woodland suitability group 2r8.

Haywood Series

The Haywood series consists of sloping or strongly sloping soils that are well drained and moderately well drained. These soils formed in material that was transported by gravity from the adjacent upland soils. The native vegetation is yellow-poplar, red oak, birch, cherry, and white ash. The understory is dogwood, spicebush, greenbrier, and native grasses.

In a representative profile the surface layer is black loam about 8 inches thick. The subsurface layer is very dark brown loam about 13 inches thick. The subsoil is about 22 inches thick. It is dark-brown fine sandy loam in the upper 8 inches and yellowish-brown fine sandy loam in the lower 14 inches. The underlying material, reaching to a depth of 49 inches, is yellowish-brown and grayish-brown, weathered granite that crushes to loamy fine sand.

Permeability is rapid, and the available water capacity is medium.

Representative profile of Haywood loam, 6 to 15 percent slopes, in a forested area where the slope is 11 percent, about 4 miles northwest of Girl Scout camp and one-half mile south of the State line:

O1—2 inches to 0, mat of hardwood leaves.

A1—0 to 8 inches, black (10YR 2/1) loam; moderate, medium, granular structure; friable; many fine and medium roots; few fine mica flakes and fine pebbles; medium acid, pH 5.9; abrupt, smooth boundary.

A2—8 to 21 inches, very dark brown (10YR 2/2) loam; weak, medium, granular structure; friable; many fine and medium roots; few angular granite stones; few fine mica flakes; strongly acid, pH 5.3; clear, smooth boundary.

B1—21 to 29 inches, dark-brown (10YR 3/3) fine sandy loam; weak, medium, subangular blocky structure; friable; common fine and medium roots; few fine mica flakes; few angular granite stones and cobblestones; strongly acid, pH 5.2; clear, wavy boundary.

B2—29 to 43 inches, yellowish-brown (10YR 5/4) fine sandy loam; weak, medium, subangular blocky structure; friable; few fine roots; many fine quartz pebbles; few granite rock fragments; strongly acid, pH 5.3; clear, wavy boundary.

C—43 to 49 inches, yellowish-brown (10YR 5/4) and grayish-brown (10YR 5/2), weathered granite that crushes to loamy fine sand; structureless; very friable; strongly acid, pH 5.3.

The solum ranges from 40 to 60 inches in thickness. Reaction in the A horizon is medium acid or slightly acid, and in the B and C horizons it is medium acid or strongly acid. The A horizon is high in organic-matter content. The A horizon is more than 20 inches thick and is very dark brown, very dark grayish brown, or black. The B horizon is dark brown or yellowish brown. It is loam or fine sandy loam. The C horizon is weathered gneiss, granite, or schist that overlies a buried horizon or a very stony layer.

Haywood soils are associated with Ashe and Porters soils. They have a thicker and darker colored surface layer than Ashe and Porters soils.

Haywood loam, 6 to 15 percent slopes (HaD).—This soil is in the coves and on toe slopes adjacent to soils on uplands.

Included with this soil in mapping are small areas of Ashe and Porters soils and Rock land. Also included are small areas that have a surface layer of sandy loam or fine sandy loam and areas that do not have a subsoil horizon.

The main concern in the management of this soil is controlling erosion. Capability unit IIIe–2; woodland suitability group 2o7.

Helena Series

The Helena series consists of gently sloping soils that are moderately well drained. These soils formed in material that weathered from aplitic granite or granite gneiss cut by dikes of basic rocks. The native vegetation is oak, gum, elm, pine, and redcedar. The understory is shrubs, vines, briers, and native grasses.

In a representative profile the surface layer is dark-brown sandy loam about 6 inches thick. The subsoil, extending to a depth of about 42 inches, is 3

inches of yellowish-brown sandy clay loam, 7 inches of light yellowish-brown sandy clay that has yellow mottles, 12 inches of pale-brown clay that has yellowish-brown and yellow mottles, 4 inches of very pale brown clay that has brownish-yellow, yellowish-red, and light-gray mottles, and 10 inches of light brownish-gray sandy clay that has brownish-yellow, light-red, yellow, and light-gray mottles. The underlying material, which extends to a depth of 48 inches, is weathered parent material that crushes to gravelly sandy clay loam and is mottled with brownish yellow, very pale, brown, light red, and light gray.

Permeability is slow, and the available water capacity is medium.

Representative profile of Helena sandy loam, 2 to 6 percent slopes, in a pasture where the slope is 4½ percent, 1 mile northwest of the junction of Roads 234 and 154:

Ap—0 to 6 inches, dark-brown (10YR 4/3) sandy loam; weak, fine, granular structure; very friable; many fine roots; common fine pores; strongly acid, pH 5.2; abrupt, smooth boundary.

B1t—6 to 9 inches, yellowish-brown (10YR 5/4) sandy clay loam; weak, fine, angular blocky structure; friable; common fine roots; common fine pores; very strongly acid, pH 4.8; clear, smooth boundary.

B21t—9 to 16 inches, light yellowish-brown (10YR 6/4) sandy clay; common, medium, distinct, yellow (10YR 7/8) mottles; moderate, medium, angular blocky structure; firm; thin discontinuous clay films on faces of peds; few fine roots; very strongly acid, pH 5.0; gradual, smooth boundary

B22t—16 to 28 inches, pale-brown (10YR 6/3) clay; common, medium, distinct, yellowish-brown (10YR 5/6) mottles and common, fine, distinct, yellow mottles; strong, coarse, angular blocky structure; very firm; continuous clay films on faces of peds; very strongly acid, pH 5.0; clear, smooth boundary.

B23t—28 to 32 inches, very pale brown (10YR 7/3) clay; common, medium, distinct, brownish-yellow (10YR 6/6) mottles and common, fine, distinct, yellowish-red and light-gray mottles; strong, coarse, angular blocky structure; very firm; patchy clay films on faces of peds; very strongly acid, pH 4.9; clear, wavy boundary.

B3tg—32 to 42 inches, light brownish-gray (10YR 6/2) sandy clay; common, medium, distinct, brownish-yellow (10YR 6/6) mottles, common, fine, prominent, light-red mottles, and few, fine, distinct, yellow and light-gray mottles; weak, coarse, angular blocky structure; firm; thin patchy clay films on faces of some peds; common fine mica flakes; many, fine, partly weathered feldspar fragments; very strongly acid, pH 4.7; clear, wavy boundary.

C—42 to 48 inches, mottled brownish-yellow (10YR 6/8), very pale brown (10YR 8/3), light-red (2.5YR 6/8), and light-gray (2.5Y 7/2), weathered parent material that crushes to gravelly sandy clay loam; rock-controlled structure; firm; common fine mica flakes; few quartz pebbles; very strongly acid, pH 4.5.

The solum commonly ranges from 30 to 48 inches in thickness. Depth to bedrock is more than 48 inches. Reaction is strongly acid or very strongly acid throughout. The A1 horizon is dark grayish brown, dark yellowish brown, or dark brown. The A2 horizon, where present, is light olive brown, light yellowish brown, light brownish gray, or pale brown. It is loamy sand or sandy loam. The Ap horizon is brown, light yellowish brown, or dark brown.

The B1t horizon is olive yellow, yellowish brown, brownish yellow, or light yellowish brown. It is sandy clay loam or clay loam. The B2t horizon is light yellowish brown. pale brown, brownish yellow, or yellowish brown that is mottled in hues of red, brown, yellow, or gray. The lower part of the B2t horizon has a very pale brown matrix in places. Gray mottling is in the upper 24 inches of the Bt horizon. The Bt horizon is sandy clay or clay. The B3t horizon is multicolored and is sandy clay or sandy clay loam. The C horizon is material weathered from granite or granite gneiss that crushes to gravelly sandy clay loam, sandy clay loam, or sandy loam.

Helena soils are associated with Appling, Durham, and Cecil soils. They are not so well drained as the Appling, Durham, and Cecil soils.

Helena sandy loam, 2 to 6 percent slopes (HbB).—This soil is on irregularly shaped saddles between drainageways and on lower side slopes adjacent to the bottom lands.

Included with this soil in mapping are small areas of Appling, Durham, and Cecil soils. Also included are small depressional areas where the surface layer is 10 to 15 inches thick and some areas that have a surface layer of loam or loamy sand.

Most of the acreage of this soil is in pasture and woodland. Tilth is easy to maintain in the surface layer. The main concern of management is controlling erosion. Capability unit IIe–3; woodland suitability group 3w8.

Hiwassee Series

The Hiwassee series consists of dark-red soils that are well drained. These soils formed in material that weathered from granite, gneiss, or schist or from old alluvium that contains more than 10 percent weatherable minerals. The native vegetation is oak, hickory, dogwood, sourwood, holly, redcedar, and pine. The understory is brambles, shrubs, briers, vines, and native grasses.

In a representative profile the surface layer is dark reddish-brown sandy loam about 7 inches thick. The subsoil, extending to a depth of 82 inches, is about 34 inches of dark-red clay, 21 inches of dark-red clay that has reddish-brown mottles, and 20 inches of dark-red sandy clay loam that has reddish-yellow mottles.

Permeability is moderate, and the available water capacity is medium.

Representative profile of Hiwassee sandy loam, 2 to 6 percent slopes, in a cultivated field where the slope is 5 percent, 80 feet south of Lynn Road and 600 feet west of the intersection of Lynn and Waters Roads:

Ap—0 to 7 inches, dark reddish-brown (2.5YR 3/4) sandy loam; weak, fine, granular structure; very friable; many fine roots; few fine pores; medium acid, pH 6.0; abrupt, smooth boundary.

B21t—7 to 21 inches, dark-red (2.5YR 3/6) clay; moderate, medium, subangular blocky structure; firm; continuous clay films on faces of peds; many fine and common medium roots; few fine and medium pores; strongly acid, pH 5.4; gradual, wavy boundary.

B22t—21 to 41 inches, dark-red (2.5YR 3/6) clay, strong, medium, subangular blocky structure; very firm; continuous clay films on faces of peds; few medium roots; few medium pores; few fine mica flakes; few dark-colored concretions; strongly acid, pH 5.4; gradual, wavy boundary.

B23t—41 to 62 inches, dark-red (2.5YR 3/6) clay; few, fine, distinct, reddish-brown mottles; moderate,

medium, subangular blocky structure; firm; patchy clay films on faces of peds; few fine mica flakes; few dark-colored concretions; strongly acid, pH 5.2; gradual, wavy boundary.

B3t—62 to 82 inches, dark-red (2.5YR 3/6) sandy clay loam; common, medium, distinct, reddish-yellow (7.5YR 8/6) mottles; weak, medium, subangular blocky structure; friable; common fine mica flakes in upper part of horizon; content of mica flakes increases with increasing depth; very strongly acid, pH 5.0.

The solum ranges from about 40 inches to more than 82 inches in thickness. Depth to hard rock ranges from about 5 feet to more than 20 feet. Reaction is medium acid through very strongly acid throughout. The A horizon is dark reddish brown or dusky red. It is sandy loam or clay loam. Moist and dry values differ by one or less in the Bt horizon. The B2t horizon is clay or clay loam. The lower part of the B2t horizon has few reddish-brown mottles. The argillic horizon contains more than 10 percent weatherable minerals.

Hiwassee soils are associated with Cecil, Cataula, Madison, and Pacolet soils. They have a darker red subsoil than the Cecil and Cataula soils. They do not have the fragipan of the Cataula soils. Hiwassee soils are darker red in the subsoil than the Madison soils and do not have mica throughout the solum as those soils. They have a thicker solum than Pacolet soils.

Hiwassee sandy loam, 2 to 6 percent slopes (HeB).—This soil is on broad ridges. It has the profile described as representative of the series.

Included with this soil in mapping are small areas of Cataula, Cecil, and Madison soils. Also included are small areas where the slope is 6 to 10 percent and small areas that have a surface layer of loam, sandy clay loam, or clay loam.

Most of the acreage of this soil is cultivated or in pasture. Tilth is fairly easy to maintain, except in the included areas where the surface layer is sandy clay loam or clay loam. The main concern of management is controlling erosion. Capability unit IIe–1; woodland suitability group 3o7.

Hiwassee sandy loam, 6 to 10 percent slopes (HeC).—This soil is on ridges and in areas adjacent to drainageways. Included with it in mapping are areas of Cataula, Cecil, and Madison soils. Also included are small areas where the slope is 2 to 6 percent or 10 to 15 percent and small areas that have a surface layer of loam, sandy clay loam, or clay loam.

Most of the acreage of this soil is cultivated or in pasture. Tilth is fairly easy to maintain, except in included areas where the surface layer is sandy clay loam or clay loam. The main concern of management is controlling erosion. Capability unit IIIe–1; woodland suitability group 3o7.

Hiwassee sandy loam, 10 to 15 percent slopes (HeD).—This soil is in irregularly shaped areas adjacent to streams. Included with it in mapping are areas of Cecil, Madison, and Pacolet soils. Also included are small areas where the slope is 6 to 10 percent or 15 to 25 percent and small areas that have a surface layer of loam, sandy clay loam, or clay loam.

The main concern in the management of this soil is controlling erosion. Capability unit IVe–1; woodland suitability group 3o7.

Hiwassee sandy loam, 15 to 25 percent slopes (HeE).—This soil is in irregularly shaped areas adjacent to medium-sized streams. Included with it in mapping are small areas of Madison and Pacolet soils. Also included are small areas where the slope is 10 to 15 percent and small areas that have a surface layer of sandy clay loam, clay loam, or gravelly sandy loam.

Most of the acreage is in forest, to which the soil is better suited than to most other uses. The main concern of management is providing a protective ground cover at all times. Capability unit VIe–1; woodland suitability group 3r8.

Hiwassee clay loam, 2 to 6 percent slopes, eroded (HlB2).—This soil is on irregularly shaped ridges. It has a profile similar to that described as representative of the series, but the surface layer is clay loam. Galled areas and rills are common, and there are a few V-shaped gullies 2 to 3 feet deep.

Included with this soil in mapping are small areas of Cataula, Cecil, and Madison soils. Also included are small areas that have a surface layer of sandy loam or sandy clay loam and small areas where the slope is 6 to 10 percent.

Most of the acreage of this soil has been cleared and cultivated. Maintaining good tilth in the plow layer without clodding or crusting is difficult, and uniform stands of crops are difficult to obtain. The main concern of management is controlling erosion. Capability unit IIIe–1; woodland suitability group 3o7.

Hiwassee clay loam, 6 to 15 percent slopes, eroded (HlD2).—This soil is in areas adjacent to streams. It has a profile similar to that described as representative of the series, but the surface layer is clay loam. Galled areas and rills are common, and there are a few shallow, V-shaped gullies and a few moderately deep gullies.

Included with this soil in mapping are small areas of Cecil, Madison, and Pacolet soils. Also included are a few areas that have a surface layer of sandy loam or sandy clay loam and small areas where the slope is 2 to 6 percent.

Most of the acreage of this soil is in forest. The main concern of management is controlling erosion. Capability unit VIe–1; woodland suitability group 3o7.

Louisburg Series

The Louisburg series consists of sloping to steep soils that are well drained to excessively drained. These soils formed in material that weathered from granite or gneiss. The native vegetation is oaks, hickory, and pines. The understory is briers, vines, shrubs, and grasses.

In a representative profile the surface layer is dark grayish-brown loamy sand about 8 inches thick. The subsoil is pale-brown sandy loam about 7 inches thick. The underlying material, extending to a depth of 27 inches, is mottled light yellowish-brown and brownish-yellow, weathered gneiss that crushes to coarse loamy sand. Hard granite rock is at a depth of 27 inches.

Permeability is rapid, and the available water capacity is low.

Representative profile of Louisburg loamy sand, 6 to 15 percent slopes, in a cultivated field where the slope

is 9 percent, 10 feet east of unimproved road and 2 miles southwest of Fairview Church:

Ap—0 to 8 inches, dark grayish-brown (10YR 4/2) loamy sand; weak, fine and medium, granular structure; very friable; many fine roots; few fine pebbles; common coarse sand grains; medium acid, pH 5.8; abrupt, smooth boundary.

B2—8 to 15 inches, pale-brown (10YR 6/3) sandy loam; weak, fine, subangular blocky structure; very friable; few fine roots; many coarse sand grains; common fine pebbles; few cobblestones; few fragments of granite; strongly acid, pH 5.4; clear, wavy boundary.

C—15 to 27 inches, mottled and streaked light yellowish-brown (10YR 6/4) and brownish-yellow (10YR 6/6) saprolite from weathered granite that crushes to coarse loamy sand; very friable; structureless; many fine and medium pebbles; common medium fragments of partly weathered granite; medium acid, pH 5.6; abrupt, smooth boundary.

R—27 inches, hard granite rock.

The solum commonly ranges from 15 to 25 inches in thickness. Depth to hard rock ranges from 24 to 46 inches. Reaction is medium acid or strongly acid throughout. The A horizon is dark grayish brown, yellowish brown, grayish brown, or brown. The B horizon is pale brown, light yellowish brown, yellowish brown, strong brown, brownish yellow, brown, yellowish red, or reddish yellow. It is 8 to 18 percent clay. Within the soil there is a discontinuous layer, 3 to 6 inches thick, that is clay loam or sandy clay. This layer commonly occurs where the soils are thickest. The C horizon is made up of partly weathered granite or gneiss.

Louisburg soils are associated with Appling, Cecil, Durham, Helena, Madison, and Pacolet soils. They are shallower to weathered rock material than all of those soils.

Louisburg loamy sand, 6 to 15 percent slopes (LuD).—This soil is on breaks above small and medium-sized streams. It has the profile described as representative of the series.

Included with this soil in mapping are small areas of Appling, Cataula, Cecil, and Madison soils. Also included are small areas that have a sandy loam surface layer, small areas of rock outcrop, which are indicated on the detailed soil map by the symbol for rock outcrop, and small areas where the slope is 15 to 25 percent.

Most of the acreage of this soil is in forest. The main concerns of management are droughtiness and controlling erosion. Capability unit VIe–2; woodland suitability group 3o7.

Louisburg loamy sand, 15 to 40 percent slopes (LuF).—This soil is adjacent to streams. Included with it in mapping are small areas of Pacolet and Madison soils and small areas that have a surface layer of sandy loam. Also included are small areas of rock outcrop, which are indicated on the detailed soil map by a special symbol.

Most of the acreage of this soil is in hardwood forest. The main concerns of management are droughtiness and controlling erosion. Capability unit VIIe–2; woodland suitability group 3r8.

Madison Series

The Madison series consists of gently sloping to moderately steep, moderately deep to deep soils that are well drained. These soils formed in material that weathered from mica schist or mica gneiss. The native vegetation is oaks, hickory, maple, elm, and pine. The understory is shrubs, vines, briers, and grasses.

In a representative profile the surface layer is brown sandy loam about 6 inches thick. The subsoil, extending to a depth of about 42 inches, is 4 inches of reddish-yellow sandy clay loam, 23 inches of red clay, and 9 inches of red clay loam that has reddish-yellow mottles. The underlying material, which extends to a depth of 60 inches, is mottled red, pink, light yellowish-brown, very pale brown, and white, weathered mica schist that crushes to sandy loam.

Permeability is moderate, and the available water capacity is medium.

Representative profile of Madison sandy loam, 2 to 6 percent slopes, in a pine forest where the slope is 3 percent, 75 feet from Griffin Road and one-half mile south of the intersection of Griffin Road and Log Shoals Road:

Ap—0 to 6 inches, brown (10YR 5/3) sandy loam; weak, fine, granular structure; very friable; many fine roots; many fine pores; few fine mica flakes; strongly acid, pH 5.5; abrupt, smooth boundary.

B1t—6 to 10 inches, reddish-yellow (5YR 6/8) sandy clay loam; weak, fine, subangular structure; friable; common fine and few medium roots; few fine pores; common fine mica flakes; very strongly acid, pH 5.0; clear, wavy boundary.

B2t—10 to 33 inches, red (2.5YR 4/6) clay; moderate, medium, subangular blocky structure; firm; continuous clay films on faces of peds; few fine and medium roots; many fine mica flakes; very strongly acid, pH 5.0; clear, wavy boundary.

B3t—33 to 42 inches, red (2.5YR 4/8) clay loam; common, fine, faint mottles of reddish yellow; weak, medium, subangular blocky structure; firm; thin patchy clay films on faces of some peds; many fine mica flakes; very strongly acid, pH 5.0; clear, wavy boundary.

C—42 to 60 inches, mottled red (2.5YR 5/6), pink (7.5YR 7/4), light yellowish-brown (10YR 6/4), very pale brown (10YR 7/4), and white (10YR 8/2), weathered mica schist that crushes to sandy loam; material has rock-controlled structure in place, but when loosened it is massive and contains fine and medium-sized fragments of less-weathered mica schist rock; friable; many fine and medium mica flakes; very strongly acid, pH 4.5.

The solum ranges from 29 to 45 inches in thickness. Depth to hard rock commonly ranges from 45 to 84 inches, but in some places saprolite extends to a depth of 200 inches. Mica flakes are few to common in the upper part of the solum and are many in the lower part. Reaction is strongly acid or very strongly acid throughout. The A horizon generally is dark brown, dark yellowish brown, yellowish brown, or brown, but in severely eroded areas, this horizon is yellowish red or red. It is sandy loam or clay loam. Rock fragments and quartz gravel are commonly on the surface. The Bt horizon is clay or clay loam that is more than 35 percent clay. The C horizon is multicolored, highly weathered mica schist or mica gneiss.

Madison soils are associated with Appling, Cecil, Hiwassee, Pacolet, and Louisburg soils. They contain more mica throughout than Appling, Cecil, Hiwassee, and Pacolet soils. They have a thicker solum than Louisburg soils.

Madison sandy loam, 2 to 6 percent slopes (McB).—This soil is on medium and broad ridges and on long side slopes adjacent to drainageways. It has the profile described as representative of the series.

Included with this soil in mapping are small areas of Appling, Cecil, and Hiwassee soils. Also included are small areas that have a surface layer of sandy clay

loam, clay loam, or gravelly sandy loam, small areas where the slope is 6 to 10 percent, and a few areas where the subsoil is dark red.

Most of the acreage is cultivated or in pasture. The plow layer is easily kept in good tilth, except in included areas where the surface layer is sandy clay loam or clay loam. The main concern of management is controlling erosion. Capability unit IIe–1; woodland suitability group 3o7.

Madison sandy loam, 6 to 10 percent slopes (McC).—This soil is on ridges and side slopes adjacent to drainageways. Included with it in mapping are small areas of Appling, Cecil, and Hiwassee soils. Also included are small areas that have a surface layer of sandy clay loam or clay loam and areas where the slope is 2 to 6 percent or 10 to 15 percent.

Most of the acreage is cultivated or in pasture. The plow layer generally is fairly easily kept in good tilth and can be tilled without clodding through a medium range of moisture content. In included areas where the surface layer is sandy clay loam or clay loam, however, tilth is difficult to maintain. The main concern of management is controlling erosion. Capability unit IIIe–1; woodland suitability group 3o7.

Madison sandy loam, 10 to 15 percent slopes (McD).—This soil is in areas adjacent to streams. Galled areas are few on this soil.

Included with this soil in mapping are small areas of Cecil, Hiwassee, and Louisburg soils. Also included are areas that have a surface layer of gravelly sandy loam, sandy clay loam, or clay loam and areas where the slope is 6 to 10 percent or 15 to 25 percent.

Most of the acreage is in mixed hardwood and pine forest or pasture. The main concern of management is controlling erosion. Capability unit IVe–1; woodland suitability group 3o7.

Madison sandy loam, 15 to 25 percent slopes (McE).—This soil is in irregularly shaped areas adjacent to streams. Included with it in mapping are small areas of Hiwassee and Louisburg soils. Also included are small areas that have a surface layer of gravelly sandy loam, sandy clay loam, or clay loam and small areas where the slope is 10 to 15 percent.

Most of the acreage of this soil is in forest of mixed hardwoods and pines. The main concern of management is providing a protective ground cover at all times. Capability unit VIe–1; woodland suitability group 3r8.

Madison clay loam, 6 to 10 percent slopes, eroded (MdC2).—This soil is on ridge crests and side slopes adjacent to drainageways. It has a profile similar to that described as representative of the series, but the surface layer is reddish-brown clay loam. Shallow gullies, rills, and galled areas are common.

Included with this soil in mapping are small areas of Appling, Cecil, and Hiwassee soils. Also included are small areas where the surface layer is sandy loam, gravelly sandy loam, or sandy clay loam; small areas where the slope is 10 to 15 percent; and a few 1- to 4-acre areas where the subsoil is dark red and contains many fine mica flakes.

Most of the acreage has been cleared and cultivated but is now in pine forest. Maintaining good tilth in the plow layer is difficult. The main concern of management is controlling erosion. Capability unit IVe–1; woodland suitability group 3o7.

Madison clay loam, 10 to 15 percent slopes, eroded (MdD2).—This soil is adjacent to streams. It has a profile similar to that described as representative of the series, but the surface layer is reddish-brown clay loam. Galled areas, shallow gullies, and rills are common.

Included with this soil in mapping are small areas of Hiwassee, Pacolet, and Louisburg soils. Also included are small areas that have a surface layer of sandy loam, gravelly sandy loam, or sandy clay loam and small areas where the slope is 6 to 10 percent.

Most of the acreage of this soil is in pine forest. The main concern of management is controlling erosion. Capability unit VIe–1; woodland suitability group 3o7.

Pacolet Series

The Pacolet series consists of strongly sloping to steep soils that are well drained. These soils formed in material that weathered from granite, gneiss, or schist. The native vegetation is oak, hickory, and pine. The understory is vines, briers, shrubs, and native grasses.

In a representative profile the surface layer is brown sandy loam about 7 inches thick. The subsoil is about 15 inches thick. The upper 8 inches of the subsoil is red clay, and the lower 7 inches is red sandy clay that has reddish-yellow mottles. The underlying material, extending to a depth of 34 inches, is mottled, weathered gneiss that crushes to sandy loam.

Permeability is moderate, and the available water capacity is medium.

Representative profile of Pacolet sandy loam, 15 to 25 percent slopes, in an area of pastured mixed forest where the slope is 18 percent, about 250 yards east of Fork Shoals and 150 feet north of South Carolina Highway 154:

Ap—0 to 7 inches, brown (10YR 5/3) sandy loam; weak, fine, granular structure; very friable; many fine roots; few fine pebbles, few fine mica flakes; strongly acid, pH 5.5; abrupt, smooth boundary.

B2t—7 to 15 inches, red (2.5YR 4/6) clay; strong, medium, subangular blocky structure; firm; thin clay films on faces of peds; many fine and few medium and coarse roots; few fine mica flakes; medium acid, pH 5.6; clear, wavy boundary.

B3t—15 to 22 inches, red (2.5YR 4/8) sandy clay; common, fine, distinct, mottles of reddish yellow; moderate, medium, subangular blocky structure; firm; thin patchy clay films on faces of some peds; few medium roots; few fine mica flakes; medium acid, pH 5.7; clear, wavy boundary.

C—22 to 34 inches, mottled yellowish-red (5YR 4/8), reddish-yellow (7.5YR 6/6), and pale-brown (10YR 6/3), weathered gneiss that crushes to sandy loam; rock-controlled structure; friable; strongly acid, pH 5.2.

The solum ranges from about 22 to 39 inches in thickness. Depth to hard rock is more than 5 feet. Reaction is medium acid to very strongly acid throughout. The A1 horizon is very dark gray or very dark grayish brown. The A2 horizon, where present, is brownish yellow, yellowish brown, or strong brown. The Ap horizon generally is

brown, yellowish brown, or brownish yellow; where this horizon is severely eroded, however, it is yellowish-red, reddish-brown, or red clay loam. The A horizon generally is sandy loam but is clay loam or clay where severely eroded.

The lower part of the B2t horizon generally contains yellowish or light-brownish mottles. The B2t horizon is clay loam or clay. The B3t horizon has yellowish-red, reddish-yellow, or brownish-yellow mottles. The B3t horizon is sandy clay, sandy clay loam, or clay loam. Few to common fine mica flakes are in the B horizon in most places. The C horizon is multicolored, weathered granite, gneiss, or schist.

Pacolet soils are associated with Cecil, Hiwassee, Cataula, Madison, and Louisburg soils. They are not so deep as Cecil and Hiwassee soils. They do not have the fragipan of Cataula soils. Pacolet soils do not have the common to many mica flakes of Madison soils. They are deeper than Louisburg soils.

Pacolet sandy loam, 15 to 25 percent slopes (PcE).—This soil is adjacent to small streams. It has the profile described as representative of the series.

Included with this soil in mapping are small areas of Cataula, Cecil, Hiwassee, Louisburg, and Madison soils. Also included are small areas that have a surface layer of loamy sand, sandy clay loam, or clay loam and areas where the slope is 25 to 40 percent.

Most of the acreage of this soil is in forest of hardwoods and pines. The main concern of management is providing a protective ground cover at all times. Capability unit VIe–1; woodland suitability group 3r8.

Pacolet sandy loam, 25 to 40 percent slopes (PcF).—This soil is adjacent to streams. Moderately deep gullies are present in places.

Included with this soil in mapping are small areas of Hiwassee and Madison soils. Also included are 1- to 4-acre areas of somewhat poorly drained soils in narrow drainage depressions, small areas where boulders are on the surface, small areas that have a sandy clay loam surface layer, small areas where the slope is 10 to 15 percent, and areas where the escarpment is other than bedrock.

Most of the acreage is in hardwood and pine forest. This soil is better suited to forest than to most other uses. The main concern of management is providing a protective ground cover at all times. Capability unit VIIe–1; woodland suitability group 3r8.

Pacolet clay loam, 10 to 15 percent slopes, eroded (PdD2).—This soil is adjacent to streams. It has a profile similar to that described as representative of the series, but the surface layer is reddish-brown clay loam. Gullies are common.

Included with this soil in mapping are small areas of Cecil, Hiwassee, and Madison soils. Also included are areas that have a surface layer of sandy loam or sandy clay loam and areas where the slope is 15 to 25 percent.

Most of the acreage of this soil is in pine forest. It is not practical to cultivate or disturb the surface layer of this soil. Maintaining good tilth is difficult. The main concern of management is providing a protective ground cover at all times. Capability unit VIe–1; woodland suitability group 3o7.

Pacolet clay loam, 15 to 25 percent slopes, eroded (PdE2).—This soil is adjacent to larger streams. It has a profile similar to that described as representative of the series, but the surface layer is reddish-brown clay loam. Galled areas, rills, and shallow gullies are common.

Included with this soil in mapping are small areas of Louisburg and Madison soils. Also included are small areas that have a surface layer of sandy loam or sandy clay loam and small areas where the slope is 10 to 15 percent.

Most of the acreage of this soil is in forest of mixed hardwoods and pines. The soil is better suited to forest than to most other uses. The main concern of management is providing a protective ground cover at all times. Capability unit VIIe–1; woodland suitability group 3r8.

Pacolet soils, 10 to 25 percent slopes, severely eroded (PfE3).—These soils are at the head of drainageways. They have a profile similar to that described as representative of the series, but the surface layer is red, reddish-brown, or yellowish-red clay loam or clay. Rills, galled areas, shallow V-shaped gullies, and deep U-shaped gullies occupy 10 to 40 percent of most areas (fig. 8).

Included with these soils in mapping are small areas of Madison and Louisburg soils. Also included are areas that have a surface layer of sandy clay loam or sandy loam and areas where the slope is 6 to 10 percent.

Most of the acreage of these soils is in forest of mixed hardwoods and pines. Reclaiming the soils for cultivation or pasture is impractical. The main concern of management is providing a protective ground cover at all times. Capability unit VIIe–1; woodland suitability group 4c3e.

Porters Series

The Porters series consists of sloping to very steep soils that are well drained. These soils formed in material that weathered from dark-colored granite or gneiss containing ferromagnesian minerals. The native vegetation is hardwoods, as well as some hemlock and white pine. The understory is shrubs, rhododendron, laurel, ferns, and huckleberry.

In a representative profile the surface layer is very dark grayish-brown and dark-brown loam about 8 inches thick. The subsoil is about 26 inches thick. The upper 4 inches of the subsoil is dark yellowish-brown loam, and the lower 22 inches is brown sandy clay loam. The underlying material, extending to a depth of 42 inches, is mottled brown and grayish-brown, weathered gneiss.

Permeability is moderately rapid, and the available water capacity is medium.

Representative profile of Porters loam, 6 to 15 percent slopes, in a cutover hardwood forest where the slope is 14 percent, about 1 mile west of Glassy Mountain:

O1—2 inches to 0, loose hardwood leaves and partly decomposed organic matter.

A11—0 to 3 inches, very dark grayish-brown (10YR 3/2) loam; moderate, medium, granular structure; very friable; many fine roots; few fine mica flakes; few quartz pebbles; very strongly acid, pH 5.0; abrupt, smooth boundary.

Figure 8.—**Deep gullies form where water is concentrated on Pacolet soils, 10 to 25 percent slopes, severely eroded.**

A12—3 to 8 inches, dark-brown (7.5YR 3/2) loam; moderate, medium, granular structure; very friable; many fine and common medium roots; few quartz pebbles and cobblestones; few fine mica flakes; very strongly acid, pH 4.9; clear, smooth boundary.

B1t—8 to 12 inches, dark yellowish-brown (10YR 4/4) loam; moderate, medium, subangular blocky structure; friable; many fine and medium roots; few large pores; few fine mica flakes; very strongly acid, pH 5.0; clear, smooth boundary.

B2t—12 to 25 inches, brown (7.5YR 4/4) sandy clay loam; weak, medium, subangular blocky structure; friable; few thin patchy clay films on faces of peds; few fine and common medium roots; many fine pores; few fine mica flakes; few quartz pebbles; few cobblestones and rock fragments; very strongly acid, pH 5.0; gradual, smooth boundary.

B3t—25 to 34 inches, brown (7.5YR 4/4) sandy clay loam; weak, medium, subangular blocky structure; friable; few patchy clay films on faces of peds; few fine and medium roots; many fine pores; few fine mica flakes; common partly weathered fragments of gneiss; strongly acid, pH 5.2; diffuse, wavy boundary.

C—34 to 42 inches, mottled brown (7.5YR 4/4) and grayish-brown (10YR 5/2), weathered rock that crushes to sandy clay loam; rock-controlled structure; many fragments of partly weathered gneiss; medium acid, pH 5.8.

The solum ranges from 22 to 38 inches in thickness. Depth to hard rock is more than 2 feet. Reaction is strongly acid or very strongly acid throughout. The A1 horizon is very dark grayish brown, very dark brown, or dark brown. The B1t horizon is dark brown, very dark brown, or dark yellowish brown. The B2t horizon is brown or dark brown and is sandy clay loam or clay loam. The B3t horizon is brown or dark brown and is sandy loam or sandy clay loam. The C horizon is mottled, partly weathered granite or gneiss rock.

Porters soils are associated with Ashe, Edneyville, Evard, and Fannin soils. They have a darker colored surface layer than Ashe, Edneyville, and Evard soils. Porters soils have a brown subsoil instead of the red subsoil of Evard soils. They do not have the micaceous subsoil of Fannin soils.

Porters loam, 6 to 15 percent slopes (PrD).—This soil is on narrow ridge crests and long side slopes. It has the profile described as representative of the series.

Included with this soil in mapping are small areas of Edneyville, Evard, and Fannin soils. Also included are areas that have common to many quartz pebbles, areas that have a surface layer of sandy loam or fine

sandy loam, and small areas where the slope is less than 6 percent or more than 15 percent.

This soil is better suited to forest than to most other uses. The main concern of management is providing a protective ground cover at all times. Capability unit IVe–1; woodland suitability group 2o7.

Porters loam, 15 to 40 percent slopes (PrF).—This soil is on long side slopes that parallel the drainageways. Included with it in mapping are small areas of Ashe, Edneyville, Evard, and Fannin soils. Also included are small areas that have a fine sandy loam surface layer or a gravelly surface layer and small areas where the slope is 6 to 15 percent or 40 to 70 percent.

Most of the acreage is in forest, to which the soil is better suited than to most other uses. The main concern of management is providing a permanent ground cover at all times. Capability unit VIIe–2; woodland suitability group 2r8.

Porters loam, 40 to 70 percent slopes (PrG).—This soil is on long, narrow side slopes. Included with it in mapping are small areas of Ashe, Edneyville, and Evard soils. Also included are small areas that have a gravelly surface layer and small areas where the slope is 25 to 40 percent.

The very steep slopes make this soil better suited to forest than to most other uses. The main concern of management is providing a permanent ground cover at all times. Capability unit VIIe–2; woodland suitability group 2r9.

Rock Land

Rock land consists of granite or schist outcrops and the adjoining areas of soil material that overlies hard rock at a depth of less than 10 inches. Rock outcrops occupy 50 to 80 percent of the area, and the rest has hard rock within a depth of 10 inches. The soil material is dominantly sandy loam but is loamy sand or loamy coarse sand in places. It is dark grayish brown, dark brown, dark yellowish brown, or brown. Slopes range from about 25 to 100 percent.

Rock land-Cleveland complex, 25 to 80 percent slopes (RoG).—This land type and soil are in areas so intricately mixed that they are mapped as one unit. Rock land is made up of outcrops of hard rock on or above the surface and adjacent areas where hard rock is within a depth of 10 inches. The Cleveland soils are similar to the soil having the profile described as representative for the Cleveland series. Rock land commonly makes up about 40 to 55 percent of the complex, and Cleveland soils commonly make up about 35 to 50 percent.

Included with this complex in mapping are small areas of Ashe, Brevard, Edneyville, Evard, Porters, Saluda, and Talladega soils. Also included are small areas that have a surface layer of channery silt loam, gravelly sandy loam, or loam.

This complex has limited use for commercial timber and is used mainly for wildlife habitat. Capability unit variable and not classified; woodland suitability group 4d3.

Saluda Series

The Saluda series consists of moderately steep to very steep soils that are well drained. These soils formed in material that weathered from granite and gneiss. The native vegetation is oaks, hickory, white pine, hemlock, and yellow-poplar. The understory is dogwood, laurel, and rhododendron.

In a representative profile the surface layer is very dark grayish-brown sandy loam about 2 inches thick. The subsurface layer is yellowish-brown sandy loam about 4 inches thick. The subsoil is about 12 inches thick. The upper 8 inches of the subsoil is yellowish-brown sandy clay loam, and the lower 4 inches is brownish-yellow sandy loam. The underlying material, reaching to a depth of about 38 inches, is light yellowish-brown loamy sand.

Permeability is moderate, and the available water capacity is medium.

Representative profile of Saluda sandy loam, in an area of Saluda and Edneyville soils, 15 to 25 percent slopes, in a hardwood forest where the slope is 23 percent, about one-half mile southeast of Caesar's Head:

O1—3 inches to 0, leaves and organic debris.

A1—0 to 2 inches, very dark grayish-brown (10YR 3/2) sandy loam; weak, medium, granular structure; very friable; many fine roots; few angular quartz fragments 15 to 25 millimeters in length; very strongly acid, pH 4.5; abrupt, smooth boundary.

A2—2 to 6 inches, yellowish-brown (10YR 5/4) sandy loam; weak, medium, granular structure; very friable; many fine roots; many medium pores; few rock fragments as much as 10 millimeters in length; strongly acid, pH 5.1; abrupt, smooth boundary.

B2t—6 to 14 inches, yellowish-brown (10YR 5/6) sandy clay loam; weak, medium, subangular blocky structure; friable; thin discontinuous clay films on faces of peds; common medium and few coarse roots; common fine pores; few granite rock fragments 2 to 8 millimeters in length; strongly acid, pH 5.1; clear, smooth boundary.

B3—14 to 18 inches, brownish-yellow (10YR 6/6) sandy loam; weak, coarse, subangular blocky structure; friable; few fine and medium roots; many fine pores; many, fine, partly weathered rock fragments; strongly acid, pH 5.2; clear, wavy boundary.

C—18 to 38 inches, light yellowish-brown (2.5Y 6/4) material weathered from granite that crushes to loamy sand; rock-controlled structure; strongly acid, pH 5.4.

The solum ranges from 12 to 20 inches in thickness. Depth to hard rock is more than 3 feet. Rock fragments that range from gravel-to boulder-size are throughout the profile in many places. Reaction is strongly acid or very strongly acid throughout. The A horizon is very dark grayish brown, dark grayish brown, dark yellowish brown, dark brown, or brown. The Bt horizon is yellowish brown, brownish yellow, or brown. It is sandy clay loam, loam, or clay loam. The Bt horizon is 10 to 15 inches thick. The C horizon is variably colored, weathered granite or gneiss.

Saluda soils are associated with Ashe, Cleveland, Edneyville, and Evard soils. They have more clay in the subsoil than Ashe and Cleveland soils. They have a thinner solum than Edneyville and Evard soils.

Saluda and Edneyville soils, 15 to 25 percent slopes (SeE).—This mapping unit is on medium and long, narrow ridge crests and sides of ridges. The Saluda soils mostly are on medium-length ridges and side

slopes. The Edneyville soils mostly are on long side slopes.

Saluda soils commonly make up about 45 to 65 percent of the mapped areas, and Edneyville soils commonly make up about 35 to 55 percent. Included with these soils in mapping are small areas of Ashe, Evard, Brevard, and Porters soils. Also included are small areas that have a channery, cobbly, stony, or gravelly surface layer or boulders on the surface and small areas where the slope is 25 to 40 percent.

These soils are fairly well suited to well suited to forest. The main concern of management is controlling erosion. Capability unit VIe–2; woodland suitability group 3d2 for Saluda soils and 2r8 for Edneyville soils.

Saluda and Edneyville soils, 25 to 40 percent slopes (SeF).—This mapping unit is on short, medium-length, and long side slopes. The Saluda soils are mostly on the short and medium side slopes, and the Edneyville soils are mostly on the long side slopes.

Saluda soils commonly make up about 45 to 70 percent of the mapped areas, and Edneyville soils commonly make up about 30 to 50 percent. Included with these soils in mapping are small areas of Ashe, Cleveland, Evard, Brevard, Fannin, Porters, and Talladega soils and small areas of Rock land. Also included are areas that have a channery, cobbly, stony, or gravelly surface layer or boulders on the surface and small areas where the slope is 15 to 25 percent or 40 to 60 percent.

Most of the acreage of this mapping unit is in forest, to which the soils are better suited than to most other uses. Capability unit VIIe–2; woodland suitability group 3d2 for Saluda soils and 2r8 for Edneyville soils.

Saluda and Edneyville soils, very steep (SFG).—This mapping unit is on long and medium-length side slopes. The Saluda soils are mostly on the upper part of the side slopes, and the Edneyville soils are mostly on the middle part. Slopes range from 60 to 80 percent.

The composition of this mapping unit is more variable than that of most other units in the survey area, but it has been controlled well enough to interpret for the anticipated uses of the soils. Saluda soils commonly make up 40 to 60 percent of the unit, and Edneyville soils commonly make up 25 to 45 percent.

Included with these soils in mapping are areas of Evard soils that occupy about 33 percent of the total acreage. Also included are small areas of Cleveland and Porters soils and of Rock land. Other inclusions are small areas that have a channery, cobbly, stony, or gravelly surface layer or have boulders on the surface.

Most of the acreage is in forest, to which the soils are better suited than to most other uses. The main concern of management is providing a protective ground cover at all times. Capability unit VIIe–2; woodland suitability group 3d3 for Saluda soils and 2r9 for Edneyville soils.

Talladega Series

The Talladega series consists of very steep soils that are well drained. These soils formed in material that weathered from schist or gneiss. The native vegetation is chiefly hardwoods, but there are some Virginia pines and shortleaf pines. The understory is laurel, rhododendron, and dogwood.

In a representative profile the surface layer is very dark brown loam about 2 inches thick. Many rocks larger than 3 inches in size are on the surface. The subsurface layer is 5 inches of dark yellowish-brown loam. The subsoil is about 21 inches thick. The upper 13 inches of the subsoil is yellowish-red sandy clay loam, and the lower 8 inches is reddish-brown sandy clay loam. The underlying material, extending to a depth of 32 inches, is partly weathered schist rock that crushes to loamy sand. Bedrock of schist and gneiss is at a depth of 32 inches.

Permeability is moderate, and the available water capacity is low.

Representative profile of Talladega loam, in an area of Talladega soils, 40 to 80 percent slopes, in a forested area where the slope is 51 percent, about three-fourths mile southwest of the southern boundary of Lake Lanier:

O1—2 inches to 0, loose, partly decomposed leaves.

A1—0 to 2 inches, very dark brown (10YR 2/2) loam; moderate, medium, granular structure; very friable; many fine and few medium roots; about 20 percent fine rock fragments; few fine mica flakes; very strongly acid, pH 4.9; abrupt, smooth boundary.

A2—2 to 7 inches, dark yellowish-brown (10YR 3/4) loam; moderate, medium, granular structure; very friable; many fine and medium roots; few fine mica flakes; common quartz pebbles; few schist fragments 5 to 15 millimeters in length; very strongly acid, pH 4.9; abrupt, smooth boundary.

B21t—7 to 20 inches, yellowish-red (5YR 4/6) sandy clay loam; moderate, medium, subangular blocky structure; friable; common fine and many medium roots; many medium pores; few fine mica flakes; about 40 percent coarse channery rock fragments of schist about 10 to 50 millimeters in length; strongly acid, pH 5.2; gradual, wavy boundary.

B22t—20 to 28 inches, reddish-brown (5YR 4/4) sandy clay loam; weak, medium, subangular blocky structure; friable; few fine roots; many coarse pores; few fine mica flakes; about 50 percent channery schist fragments 10 to 60 millimeters in length; strongly acid, pH 5.3; clear, irregular boundary.

C—28 to 32 inches, thinly bedded and broken schist and gneiss that have tongues and pockets of reddish-brown or yellowish-red material that crushes to loamy sand; rock-controlled structure; about 70 percent channery fragments; few fine mica flakes; strongly acid, pH 5.5; clear, irregular boundary.

R—32 inches, bedrock of schist and gneiss; difficult to break by using hand tools.

Depth to bedrock is highly variable. For the most part, bedrock is at a depth of 20 to 38 inches, but within a short distance it can be found within 10 inches of the surface. Where the soils are shallow the Bt horizons are absent. Reaction is strongly acid or very strongly acid throughout. Few fine mica flakes are throughout the soil. The soil contains about 40 percent coarse channery fragments of rock. The A1 horizon is very dark brown, very dark grayish brown, or dark reddish brown. The A2 horizon is dark yellowish brown, dark brown, or dark reddish brown. The A horizon is sandy loam, fine sandy loam, silt loam, or loam. Hard rock or bedrock outcrops are at the surface in many places. Angular channery fragments of rock or pebbles, as well as cobblestones, also are on the surface.

The B21t horizon is yellowish red, red, or dark red. The B21t horizon is about 38 to 50 percent channery cobblestones and coarse fragments of rock. The B22 horizon is yellowish

red, reddish brown, or red. It is about 50 percent channery rock fragments of mica schist that range from 10 to 60 millimeters in length.

The C horizon is commonly at a depth of 18 to 36 inches and consists mostly of broken and weathered fragments of mica schist or gneiss. Tongues of the Bt horizon extend into broken cracks and along horizontal cleavage planes.

In some areas these soils are redder than the defined range for the series, but this does not significantly alter their usefulness or behavior.

Talladega soils are associated with Evard, Fannin, and Porters soils. They have a thinner solum than Evard soils. They do not have the mica content of Fannin soils. The subsoil of Talladega soils is redder than that of Porters soils, and it is interrupted by bedrock.

Talladega soils, 40 to 80 percent slopes (TdG).—These soils are on narrow ridge crests and long side slopes. Talladega loam and closely similar soils that have more stones and gravel throughout the profile than Talladega loam characterize this mapping unit.

Included with the unit in mapping are small areas of Ashe, Evard, Fannin, and Porters soils and Rock land. Also included are small areas that have a channery surface layer and small areas where rock is exposed.

These soils are better suited to forest than to most other uses. The principal concern of management is providing a protective ground cover at all times. Capability unit VIIe–2; woodland suitability group 3r3.

Toccoa Series

The Toccoa series consists of nearly level soils that are well drained. These soils formed in thick alluvium that washed from soils derived from granite, gneiss, schist, and basic rock. The native vegetation is mixed hardwoods. The understory is vines, shrubs, canes, briers, and native grasses.

In a representative profile the surface layer is brown sandy loam about 7 inches thick. The underlying material, extending to a depth of 52 inches, is 8 inches of brown fine sandy loam, 15 inches of brown sandy loam that has stratified lenses of yellowish-brown loamy fine sand, 12 inches of yellowish-brown sandy loam, and 10 inches of light yellowish-brown loamy sand that has stratified lenses of sandy loam.

Toccoa soils are subject to flooding for short periods. Permeability is moderately rapid, and the available water capacity is medium.

Representative profile of Toccoa sandy loam, in an area of Cartecay and Toccoa soils, in a pasture where the slope is 1 percent, 1½ miles southeast of Roper Mountain Church:

Ap—0 to 7 inches, brown (10YR 4/3) sandy loam; weak, fine, granular structure; very friable; many fine and few medium roots; few fine mica flakes; medium acid, pH 5.6; abrupt, smooth boundary.

C1—7 to 15 inches, brown (7.5YR 5/4) fine sandy loam; structureless and stratified; very friable; many fine and few medium roots; few fine mica flakes; thin bedding planes of loam and sandy loam; medium acid, pH 5.7; clear, smooth boundary.

C2—15 to 30 inches, brown (10YR 5/3) sandy loam; structureless and stratified; very friable; thin streaks of yellowish-brown (10YR 5/6) loamy fine sand; few fine roots; common fine mica flakes; medium acid, pH 5.6; clear, smooth boundary.

C3—30 to 42 inches, yellowish-brown (10YR 5/6) sandy loam; structureless and stratified; very friable; few fine roots; few, fine, water-rounded quartz pebbles; common medium mica flakes; medium acid, pH 5.7; clear, smooth boundary.

C4—42 to 52 inches, light yellowish-brown (10YR 6/4) loamy sand; structureless and stratified with silt and sandy loam; very friable; few, fine, water-rounded quartz pebbles; strongly acid, pH 5.5.

Reaction is slightly acid to medium acid in the upper 40 inches of the profile. The surface layer is dark reddish brown, reddish brown, dark brown, or brown. It is sandy loam, fine sandy loam, loamy sand, or sandy clay loam. In some recently overwashed areas, fine gravel or clay loam deposits are on the surface. The C horizon is similar in color to the A horizon. Thin bedding planes of contrasting texture are evident throughout. Gray mottles are below depths of 24 inches in some places. Water-rounded gravel strata are in some places below a depth of 48 inches.

Toccoa soils are associated with Buncombe, Congaree, Cartecay, Chewacla, and Wehadkee soils. They are not so sandy as Buncombe soils. They do not have so much clay between depths of 10 and 40 inches as the Congaree soils. Toccoa soils are better drained than the Cartecay, Chewacla, and Wehadkee soils.

In this county the Toccoa soils are mapped only in an undifferentiated group with the Cartecay soils. A description of this mapping unit is given under the heading "Cartecay Series."

Urban Land

Urban land (Ur) forms the business district of Greenville. Approximately 85 percent of the area is covered by pavement and by industrial, commercial, or residential buildings. Virtually all of the rainfall in this area runs off. Rainwater reaches major drains quickly.

Included with this land type in mapping are small areas of disturbed soils.

Urban land is not used for farming. Where the natural soil is exposed or is covered by suitable fill material, the soil is well suited to lawn grasses, trees, and shrubs. Capability unit and woodland suitability group not assigned.

Wehadkee Series

The Wehadkee series consists of nearly level soils that are poorly drained. These soils formed in loamy sediment washed from soils that formed in material weathered from granite, gneiss, schist, and basic rock. The native vegetation is gum, water oak, ash, elm, and alder. The understory is vines, briers, canes, and wetland grasses.

In a representative profile the surface layer, about 6 inches thick, is dark-brown silt loam that has grayish-brown mottles. The subsoil is about 34 inches thick. The upper 10 inches of the subsoil is gray loam that has grayish-brown mottles, and the lower 24 inches is gray silty clay loam that has strong-brown mottles. The underlying material, extending to a depth of 52 inches, is gray sandy loam that has strong-brown mottles.

Wehadkee soils are inherently wet. Permeability is moderate, and the available water capacity is high.

Representative profile of a Wehadkee soil, in an area of Wehadkee soils, in a nearly level unimproved pasture near the Saluda River, 100 feet south of South

Carolina Highway 288 and about 4 miles west of Marietta:

Ap—0 to 6 inches, dark-brown (10YR 4/3) silt loam; few, fine, faint, grayish-brown mottles; weak, medium, granular structure; very friable; many fine roots; few fine mica flakes; few brown stains in old root channels; slightly acid, pH 6.2; abrupt, smooth boundary.

B1g—6 to 16 inches, gray (10YR 5/1) loam; common, medium, distinct, grayish-brown (2.5Y 5/2) mottles; structureless; friable; common fine roots; few fine mica flakes; brown stains in old root channels; medium acid, pH 6.0; clear, smooth boundary.

B2g—16 to 40 inches, gray (10YR 6/1) silty clay loam; few, medium, distinct, strong-brown (7.5YR 5/8) mottles; structureless; friable; few fine mica flakes; few quartz pebbles; medium acid, pH 6.0; clear, smooth boundary.

Cg—40 to 52 inches, gray (10YR 6/1) sandy loam; common, medium, distinct, strong-brown (7.5YR 5/8) mottles; structureless; loose; stratified with layers of loam, sand, and silt; few water-rounded pebbles; common fine mica flakes; medium acid, pH 5.7.

The solum ranges from 35 to 60 inches in thickness. Reaction is medium acid or slightly acid throughout. Content of fine mica flakes ranges from few to common. Brown concretions are in the profile in some places. The A horizon is dark grayish brown, grayish brown, dark brown, or brown. In some places the profile is mottled in shades of brown. The texture is loam, fine sandy loam, silt loam, or silty clay loam. The B horizon is gray or light gray mottled in shades of brown and yellow. It is loam, silty clay loam, clay loam, or sandy clay loam. The C horizon is sandy loam or is stratified loam sand, sand, silt, clay, or gravel.

Wehadkee soils are associated with Buncombe, Cartecay, Chewacla, Congaree, and Toccoa soils. They are more poorly drained and have more gray in the subsurface layer than all of those soils.

Wehadkee soils (Wd).—These soils are in poorly drained, elongated areas on the flood plains of creeks and rivers. The elongated areas are generally adjacent to the uplands. Wehadkee silt loam and closely similar, poorly drained to moderately well drained soils characterize this mapping unit.

Included with the unit in mapping are small areas of Cartecay, Chewacla, and Congaree soils. Also included are small areas of recent overwash material 1 to 10 inches thick, and areas of similar soils that are slightly more acid throughout.

Most areas of these Wehadkee soils are in water-tolerant hardwoods. In most places the tilth is poor and difficult to maintain. Drainage and flooding are principal concerns of management. Capability unit IVw–1; woodland suitability group 1w9.

Wickham Series

The Wickham series consists of gently sloping soils that are well drained. These soils formed in alluvium that washed from soils formed in material weathered from granite, gneiss, and schist. The native vegetation is mixed hardwoods and pines. The understory is briers, vines, and grasses.

In a representative profile the surface layer is dark yellowish-brown sandy loam about 9 inches thick. The subsoil, extending to a depth of about 60 inches, is about 3 inches of dark yellowish-brown sandy clay loam, 3 inches of reddish-brown clay loam, 33 inches of yellowish-red clay loam, and 12 inches of yellowish-brown sandy clay loam. The underlying material, reaching to a depth of 72 inches, is light yellowish-brown sandy loam that contains water-rounded pebbles.

Permeability is moderate, and the available water capacity is medium.

Representative profile of Wickham sandy loam, 2 to 6 percent slopes, in a cultivated field where the slope is 4 percent, about 2 miles north of Gap Creek Church:

Ap—0 to 9 inches, dark yellowish-brown (10YR 4/4) sandy loam; weak, fine, granular structure; very friable; many fine roots; many fine and medium pores; few fine quartz pebbles; few fine mica flakes; medium acid, pH 5.6; abrupt, smooth boundary.

B1t—9 to 12 inches, dark yellowish-brown (10YR 4/4) sandy clay loam; weak, medium, subangular blocky structure; very friable; many fine roots; many medium pores; few fine mica flakes; very strongly acid, pH 4.8; abrupt, smooth boundary.

B21t—12 to 15 inches, reddish-brown (5YR 4/4) clay loam; moderate, medium, subangular blocky structure; friable; thin continuous clay films on faces of peds; few fine roots; many medium pores; few fine mica flakes; strongly acid, pH 5.2; clear, smooth boundary.

B22t—15 to 48 inches, yellowish-red (5YR 5/6) clay loam; moderate, medium, subangular blocky structure; friable; thin clay films on faces of peds; few fine roots; common fine and medium pores; few fine mica flakes; strongly acid, pH 5.4; clear, smooth boundary.

B3t—48 to 60 inches, yellowish-brown (10YR 5/6) sandy clay loam; weak, medium, subangular blocky structure; friable; patchy faint clay films on faces of peds; few fine roots; common fine pores; few fine mica flakes; few water-worn pebbles; strongly acid, pH 5.2; gradual, smooth boundary.

IIC—60 to 72 inches, light yellowish-brown (10YR 6/4) sandy loam; structureless; loose; 40 percent very coarse pebbles and 20 percent coarse pebbles; strongly acid, pH 5.3.

The solum ranges from 40 to 60 inches in thickness. Reaction is medium acid to very strongly acid below the A horizon. Depth to hard rock is more than 6 feet. Lithologic discontinuities are at varying depths within the solum. Water-rounded pebbles are in the profile in some places. The A horizon is dark yellowish brown, yellowish brown, dark brown, or brown.

The B1t horizon is dark yellowish brown, strong brown, or reddish yellow. It is sandy loam or sandy clay loam. The B2t horizon is reddish brown, yellowish red, or red. It is sandy clay loam, sandy clay, clay loam, or loam. The B3t horizon is reddish yellow, yellowish brown, or yellowish red. It is sandy loam, sandy clay loam, or clay loam. The C horizon is light yellowish brown, yellowish brown, yellowish red, or red. It is sandy clay loam, sandy loam, clay loam, or clay. Strata of water-rounded pebbles or cobblestones are in the lower part of the B horizon and in the C horizon.

Wickham soils are associated with Congaree, Toccoa, Hiwassee, and Cecil soils. They are at higher elevations than the Congaree and Toccoa soils and are not flooded as those soils are. They do not have the dark-red subsoil of the Hiwassee soils. Wickham soils have less clay in the B horizon than Cecil soils.

Wickham sandy loam, 2 to 6 percent slopes (WhB).——This soil is in long, narrow areas on the second terraces of larger streams. Included with it in mapping are small areas of Cecil, Hiwassee, Congaree, and Toccoa soils. Also included are small areas that have a

surface layer of gravelly sandy loam or fine sandy loam.

Most of this soil is cultivated or in pasture. Tilth is easily maintained in the plow layer. The main concern of management is controlling erosion. Capability unit IIe–1; woodland suitability group 3o7.

Use and Management of the Soils

This section contains information about the use and management of the soils for crops, pasture, woodland, wildlife habitat, engineering, and town and country planning. Also given are predicted yields of principal crops under a high level of management and suitability of soils to selected crops.

The management of crops and pasture and of woodland is discussed by groups of soils. To determine the soils in each of these groups, refer to the "Guide to Mapping Units" at the back of this survey.

Capability Grouping

Capability grouping shows, in a general way, the suitability of soils for the most kinds of field crops. The soils are grouped according to their limitations when used for field crops, the risk of damage when they are so used, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to rice, cranberries, horticultural crops, or other crops requiring special management.

Those familiar with the capability classification can infer from it much about the behavior of soils when used for other purposes, but this classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for range, for forest trees, or for engineering.

In the capability system, the kinds of soils are grouped at three levels: the capability class, subclass, and unit. These are discussed in the following paragraphs.

CAPABILITY CLASSES, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use, defined as follows:

Class I soils have few limitations that restrict their use. (No class I soils were mapped in Greenville County.)

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants, require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants, require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use largely to pasture, range, woodland, or wildlife. (No class V soils were mapped in Greenville County.)

Class VI soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife.

Class VII soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to pasture or range, woodland, or wildlife.

Class VIII soils and landforms have limitations that preclude their use for commercial plants and restrict their use to recreation, wildlife, or water supply or to esthetic purposes. (No class VIII soils were mapped in Greenville County.)

CAPABILITY SUBCLASSES are soil groups within one class; they are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses, because the soils of this class have few limitations. Class V can contain, at the most, only the subclasses indicated by *w*, *s*, and *c*, because the soils in class V are subject to little or no erosion, though they have other limitations that restrict their use largely to pasture, range, woodland, wildlife, or recreation.

CAPABILITY UNITS are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe–1 or IIIe–2. Thus, in one symbol, the Roman numeral designates the capability class, or degree of limitation; the small letter indicates the subclass, or kind of limitation, as defined in the foregoing paragraph; and the Arabic numeral specifically identifies the capability unit within each subclass.

In the following pages, the capability units in Greenville County are described and suggestions for the use and management of the soils are given.

Management by capability units [2]

In this section each capability unit is described and some suggestions for use and management of the soils in each unit are given. To find the soils in each capa-

[2] CHARLES A. HOLDEN, JR., conservation agronomist, Soil Conservation Service, helped write this section.

bility unit, refer to the "Guide to Mapping Units" at the back of this survey.

CAPABILITY UNIT IIe–1

Soils in this capability unit are gently sloping and slightly eroded. They have a surface layer of sandy loam and a subsoil of clay loam to clay. The root zone is moderately deep to deep.

Permeability of these soils is moderate, and the available water capacity is medium. Natural fertility is low.

Appropriate water disposal systems and careful management (fig. 9) are needed to control erosion in fields that are cropped. Cover crops are necessary in orchards.

CAPABILITY UNIT IIe–2

Soils in this capability unit are gently sloping, deep, and well drained. They have a surface layer of loamy sand to sandy loam, about 8 inches thick, and a subsoil of sandy clay loam to clay.

Permeability of these soils is moderate, and the available water capacity is medium. Natural fertility is low.

Management to control erosion on these soils includes the use of crop rotations in which perennial grasses and legumes are grown; terracing; grassing the waterways; and using contour tillage. Soils of this unit are suitable for recreation (fig. 10).

CAPABILITY UNIT IIe–3

Helena sandy loam, 2 to 6 percent slopes, is the only soil in this capability unit. This soil has a moderately deep to deep root zone. It has a surface layer of sandy loam over a subsoil of sandy clay to clay.

Permeability is slow, and the available water capacity is medium. Natural fertility is low.

The principal concerns of management are controlling erosion and maintaining a favorable root zone. Water management systems that include contour tillage, terraces, and grassed waterways are needed to control erosion.

CAPABILITY UNIT IIw–2

Congaree fine sandy loam is the only soil in this capability unit. This soil is deep, nearly level, and well drained. It is on the first bottom lands adjacent to major streams. The surface layer is fine sandy loam, and the underlying material is sandy clay loam.

Permeability is moderate, and the available water capacity is medium. Natural fertility is high.

The principal concern in managing this soil is the prevention of floods. The soil is subject to occasional

Figure 9.—**Stripcropping is used to control erosion on Cecil sandy loam, 2 to 6 percent slopes.**

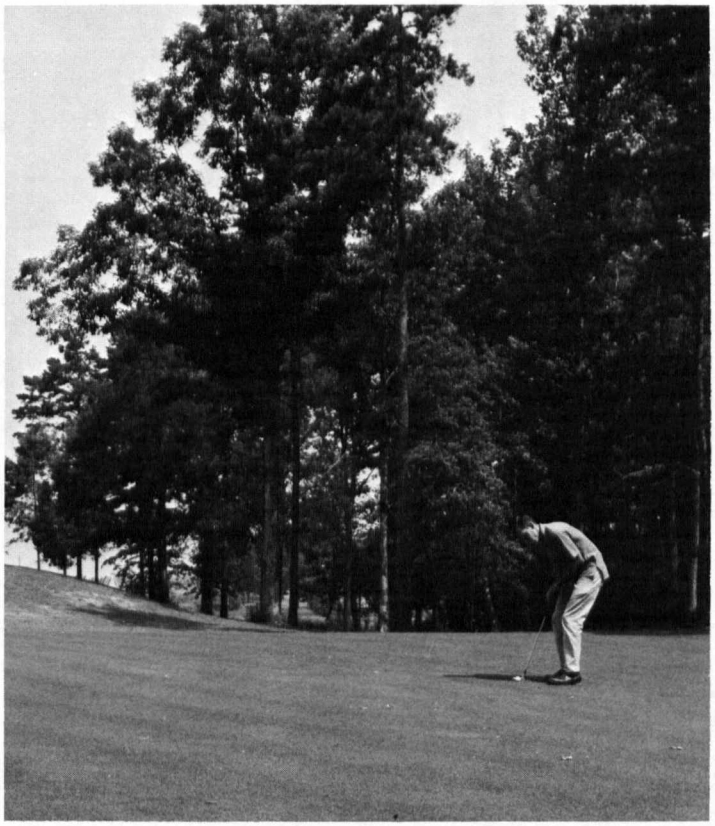

Figure 10.—**Appling sandy loam, 2 to 6 percent slopes, is suitable for recreation.**

flooding at any time of the year, but floods seldom last for more than 2 days.

CAPABILITY UNIT IIIe–1

Soils in this capability unit are gently sloping to sloping and are uneroded to eroded. They have a moderately deep to deep root zone. They have a surface layer of sandy loam or clay loam and a subsoil of clay loam or clay.

Permeability is moderate, and the available water capacity is medium. Natural fertility is low.

Erosion control practices that are essential for continued cropping include the use of terraces and grassed waterways, contour stripcropping, and field borders (fig. 11). Also needed are cropping systems that include intensive crop-residue management and frequent sod crops.

CAPABILITY UNIT IIIe–2

Soils in this capability unit are sloping to strongly sloping and are slightly eroded. They are on ridges and side slopes adjacent to drainageways or uplands. These soils have a moderately deep to deep root zone. They have a surface layer of sandy loam, fine sandy loam, or loam and a subsoil of fine sandy loam, sandy clay loam, or clay.

Permeability is moderate to rapid, and the available water capacity is medium. Natural fertility is low.

The principal concern in the management of these soils is controlling erosion. Effective management systems include the use of grassed waterways, terraces, contour farming or stripcropping, and sod crops in the rotation.

CAPABILITY UNIT IIIe–3

Cataula sandy loam, 2 to 6 percent slopes, eroded, is the only soil in this capability unit. This soil is on medium-width and narrow ridges. It has a surface layer of sandy loam over a clay subsoil that is moderately deep to a fragipan.

Permeability is slow, and the available water capacity is medium. Natural fertility is low.

The principal concern in the management of this soil is controlling erosion, but management is also affected by the fragipan, which restricts root development. Grassed waterways, terraces, and contour farming or stripcropping are essential for controlling erosion. Cropping sequences that include frequent sod crops are used to maintain a favorable root zone and to control erosion.

CAPABILITY UNIT IIIw–2

Soils in this capability unit are nearly level and well drained to somewhat poorly drained. These soils are in drainageways and on narrow to medium-width flood plains along the branches, creeks, and larger streams. They have a surface layer of variable texture, and the underlying soil material is loamy alluvial sediment.

Permeability is moderate to moderately rapid, and the available water capacity ranges from low to high. Natural fertility ranges from low to high, and the organic-matter content is medium to high.

The principal concerns in the management of these soils are drainage, siltation, a high water table, and flooding. Effective management provides ditches for drainage and diversions that protect the soils from runoff from adjacent uplands and from flooding. Unless the soils are protected from flooding, the loss of a crop can be expected every 3 to 5 years.

CAPABILITY UNIT IIIs–2

Buncombe loamy sand, 2 to 5 percent slopes, is the only soil in this capability unit. This soil is excessively drained and is on sandy bottom lands along the larger streams. It has a loamy sand surface layer that overlies loamy sand or sandy alluvial material.

Permeability is rapid, and the available water capacity is low. Natural fertility is very low.

The principal concerns of management are flooding, droughtiness, leaching, and very low fertility. Effective management provides measures that control flooding, maintain a permanent sod cover, add humus, and protect the soil from overgrazing. Unless there is protection from flooding, the loss of a crop 1 year in 3 is expected. This soil is easily tilled, but it is droughty and most of it is in woodland.

CAPABILITY UNIT IVe–1

Soils in this capability unit are moderately deep to deep, well drained, and mainly sloping to strongly sloping. The sloping soils are eroded and are on side

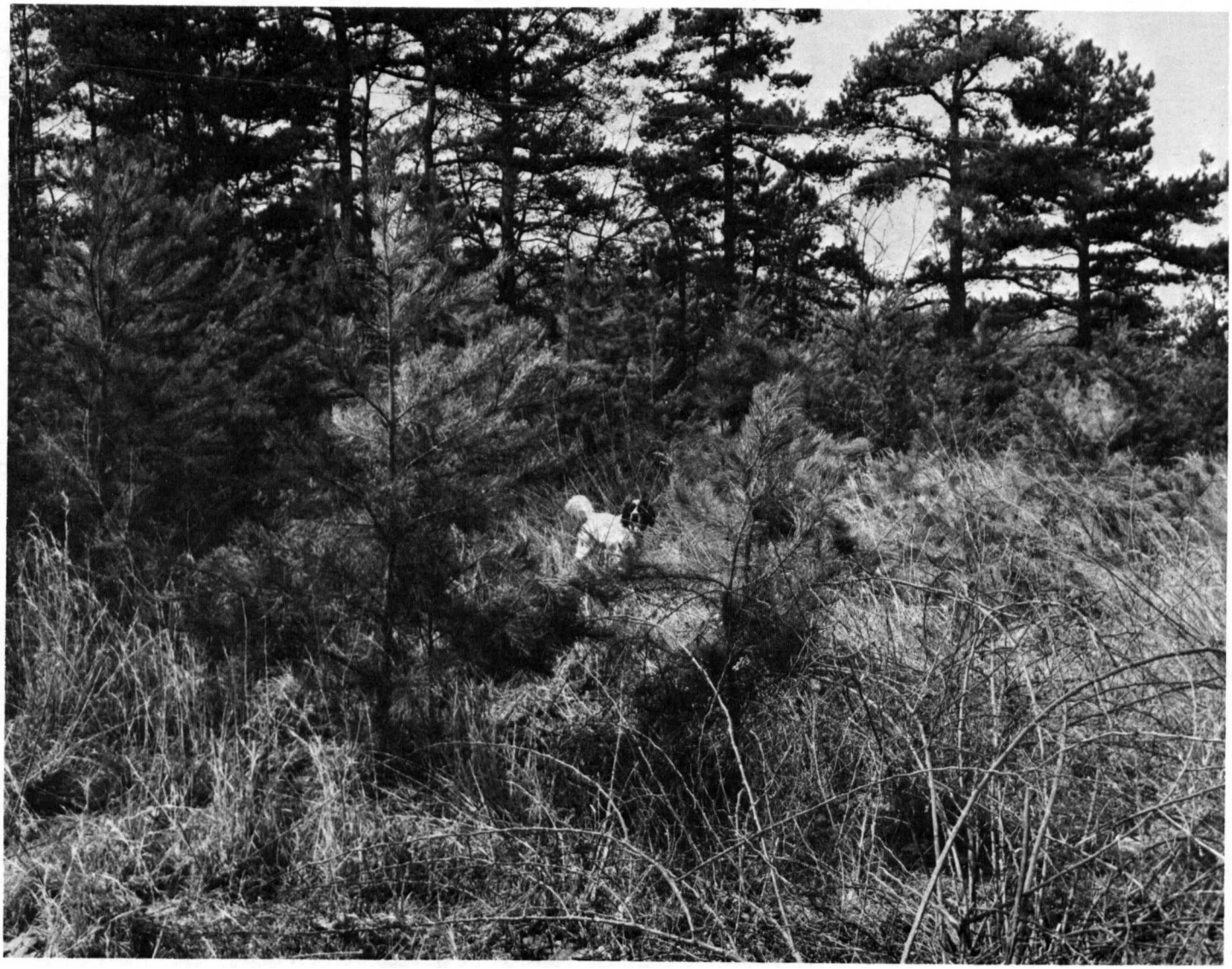

Figure 11.—**Hiwassee sandy loam, 6 to 10 percent slopes, is suited to bicolor lespedeza, an excellent source of winter food for bobwhite quail.**

slopes adjacent to drainageways and ridge crests. The strongly sloping soils are on ridge crests and adjacent to streams. The sloping soils have a surface layer of sandy clay loam or clay loam, and the strongly sloping soils have a surface layer of sandy loam, fine sandy loam, or loam. Also in the unit are a few areas of gently sloping soils. All of these soils have a subsoil of sandy clay loam, clay loam, or clay.

Permeability is moderate or moderately rapid, and the available water capacity is medium. Natural fertility is low.

The principal concern in the management of these soils is controlling erosion. Because the soils generally are sloping or strongly sloping, both tillage and the control of erosion are difficult. Cultivated crops are grown occasionally, but frequent crops of grasses and legumes are needed in the rotation to help control erosion.

CAPABILITY UNIT IVe–2

Cataula sandy loam, 6 to 10 percent slopes, eroded, is the only soil in this capability unit. This soil is on ridge crests and side slopes adjacent to drainageways. It has a surface layer of sandy loam underlain by a clay subsoil that is moderately deep to a fragipan.

Permeability is slow, and the available water capacity is medium. Natural fertility is low.

The principal concern in the management of this soil is controlling erosion, but management is also affected by the fragipan, which restricts root development and water movement. If row crops are grown, frequent crops of perennial grasses or legumes are needed in the rotation to help control erosion.

CAPABILITY UNIT IVw–1

Wehadkee soils are the only soils in this capability unit. These soils are nearly level and poorly drained.

They are in elongated areas on the flood plains of the creeks and rivers, generally adjacent to uplands. The surface layer is loam, fine sandy loam, silt loam, or silty clay loam and is underlain by loamy sediment that washed from soils at higher elevations. Because the water table is high, the root zone is shallow to moderately deep.

Permeability is moderate, and the available water capacity is high. These soils are medium in organic-matter content and in natural fertility.

The principal concerns in the management of these soils are drainage and flooding. If the soils are adequately drained, they can be used for improved pasture. Effective management provides drainage by ditches and diversions that protect against flooding.

CAPABILITY UNIT VIe–1

Soils in this capability unit are moderately deep to deep, well drained, uneroded or eroded, and mainly strongly sloping to moderately steep. Also in the unit are a few sloping areas. These soils are on side slopes adjacent to streams and ridge crests. The uneroded soils have a surface layer of fine sandy loam or sandy loam. The eroded, strongly sloping soils have a surface layer of clay loam. All the soils have a subsoil of sandy clay loam, clay loam, or clay.

Permeability is moderate, and the available water capacity is medium. Natural fertility is low.

The soils in this unit are better suited to trees than to most other plants. The principal concern of management is controlling erosion. If the soils are used for pasture, grazing needs to be controlled to maintain a sod cover.

CAPABILITY UNIT VIe–2

Soils in this capability unit are shallow to moderately deep and well drained to excessively drained. These soils are moderately steep on side slopes and are sloping on breaks adjacent to the streams. They have a surface layer of fine sandy loam, sandy loam, or loamy sand and a subsoil of sandy loam or sandy clay loam that contains partly weathered rock.

Permeability is moderate to rapid, and the available water capacity is low to medium. Natural fertility is low.

These soils are better suited to forest than to most other uses. The principal concerns of management are erosion and droughtiness. If the soils are used for pasture, grazing needs to be controlled.

CAPABILITY UNIT VIIe–1

In this capability unit are strongly sloping to moderately steep soils that are eroded or severely eroded and steep soils that are uneroded. All of these soils are moderately deep and well drained. They are on short slopes adjacent to the streams and at the heads of drainageways. The surface layer is sandy loam, sandy clay loam, clay loam, or clay and is underlain by clay.

Permeability is moderate, and the available water capacity is medium. Natural fertility is low.

The soils in this unit are too steep or too severely eroded for cultivated crops or pasture. They are suited to forest and as habitat for wildlife.

CAPABILITY UNIT VIIe–2

Soils in this capability unit are deep to shallow, moderately steep to very steep, and well drained to excessively drained. These soils are on narrow ridge crests and side slopes adjacent to the valleys and streams. The surface layer is loamy sand, sandy loam, fine sandy loam, or loam. Gravel or stone outcrops are at the surface of most of these soils. The subsoil is discontinuous in the shallow soils, but it is sandy loam or sandy clay loam in the deep and moderately deep soils.

Permeability is moderate to rapid, and the available water capacity is low or medium. Natural fertility is low.

The soils in this unit are too steep for cultivated crops or pasture. They are suited to forest and as habitat for wildlife.

Suitability of the Soils for Crops

Suitability ratings of some of the soils in the county for stated crops are shown in table 2. Soils that are well suited to a given crop have few hazards and limitations. Intensive management is not needed, and favorable yields are likely. Soils that are only fairly well suited are limited by excess moisture, too little moisture, a shallow root zone, low fertility, or some other limitation. Where the soils are not well suited, favorable yields are not likely unless intensive management is practiced. Generally, this management is not economically feasible. On soils that are poorly suited, growing the crop is not practical.

Predicted yields

Table 3 (page 38) lists predicted yields of the principal crops grown in the county. The predictions are based on estimates made by farmers, soil scientists, and others who have knowledge of yields in the county, and on information taken from research data. The predicted yields are average yields per acre that can be expected by good commercial farmers at the level of management that tends to produce the highest economic returns.

Not included in this table are soils that are used only for grazing or for recreation.

Crops other than those shown in table 3 are grown in the county, but their predicted yields are not included because their acreage is small or reliable data on yields are not available.

The predicted yields given in table 3 can be expected if the following management practices are used:

1. Rainfall is conserved and water management systems are applied.
2. Surface or subsurface drainage systems, or both, are installed where needed.
3. Crop residue is managed to maintain soil tilth and help control erosion.
4. Minimum but timely tillage is used.
5. Insecticides and herbicides are used properly.
6. Fertilizer and lime are applied correctly.
7. Improved crop varieties are used.

TABLE 2.—*Suitability of selected*

Soil	Corn	Soybeans	Cotton
Appling sandy loam, 2 to 6 percent slopes	Well suited	Well suited	Well suited
Appling sandy loam, 6 to 10 percent slopes	Fairly well suited	Fairly well suited	Fairly well suited
Brevard fine sandy loam, 6 to 10 percent slopes	Well suited	Well suited	Poorly suited
Brevard fine sandy loam, 10 to 15 percent slopes	Fairly well suited	Not well suited	Poorly suited
Brevard sandy clay loam, 2 to 10 percent slopes, eroded	Fairly well suited	Not well suited	Poorly suited
Buncombe loamy sand, 2 to 5 percent slopes	Not well suited	Poorly suited	Poorly suited
Cartecay and Chewacla soils	Fairly well suited	Fairly well suited	Poorly suited
Cartecay and Toccoa soils	Fairly well suited	Not well suited	Poorly suited
Cataula sandy loam, 2 to 6 percent slopes, eroded	Not well suited	Fairly well suited	Fairly well suited
Cataula sandy loam, 6 to 10 percent slopes, eroded	Poorly suited	Poorly suited	Not well suited
Cecil sandy loam, 2 to 6 percent slopes	Well suited	Well suited	Well suited
Cecil sandy loam, 6 to 10 percent slopes	Well suited	Well suited	Well suited
Cecil sandy loam, 10 to 15 percent slopes	Fairly well suited	Fairly well suited	Fairly well suited
Cecil clay loam, 2 to 6 percent slopes, eroded	Fairly well suited	Fairly well suited	Fairly well suited
Cecil clay loam, 6 to 10 percent slopes, eroded	Not well suited	Not well suited	Not well suited
Chewacla soils	Well suited	Fairly well suited	Poorly suited
Congaree fine sandy loam	Well suited	Well suited	Poorly suited
Durham loamy sand, 2 to 6 percent slopes	Well suited	Fairly well suited	Well suited
Edneyville fine sandy loam, 6 to 10 percent slopes	Fairly well suited	Fairly well suited	Poorly suited
Edneyville fine sandy loam, 10 to 15 percent slopes	Not well suited	Not well suited	Poorly suited
Haywood loam, 6 to 15 percent slopes	Well suited	Fairly well suited	Poorly suited
Helena sandy loam, 2 to 6 percent slopes	Fairly well suited	Well suited	Fairly well suited
Hiwassee sandy loam, 2 to 6 percent slopes	Well suited	Well suited	Well suited
Hiwassee sandy loam, 6 to 10 percent slopes	Fairly well suited	Well suited	Fairly well suited
Hiwassee sandy loam, 10 to 15 percent slopes	Not well suited	Not well suited	Not well suited
Hiwassee clay loam, 2 to 6 percent slopes, eroded	Not well suited	Fairly well suited	Fairly well suited
Madison sandy loam, 2 to 6 percent slopes	Well suited	Well suited	Well suited
Madison sandy loam, 6 to 10 percent slopes	Fairly well suited	Well suited	Well suited
Madison sandy loam, 10 to 15 percent slopes	Fairly well suited	Fairly well suited	Fairly well suited
Madison clay loam, 6 to 10 percent slopes, eroded	Not well suited	Not well suited	Not well suited
Porters loam, 6 to 15 percent slopes	Not well suited	Poorly suited	Poorly suited
Wehadkee soils	Not well suited	Not well suited	Poorly suited
Wickham sandy loam, 2 to 6 percent slopes	Well suited	Well suited	Well suited

Use of the Soils for Woodland [3]

Originally, Greenville County was mainly wooded. Now trees cover about 56 percent of the county.

Good stands of commercial trees are produced in the woodland of the county. Needleleaf forest trees are most commonly on the uplands. Broadleaf trees generally are dominant on the bottoms along the rivers and creeks and on side slopes and ridges in the mountains.

The value of the wood products in the county is substantial, although the potential value is higher. Other valuable uses of woodland include grazing, wildlife habitat, recreation, natural beauty, and conservation of soil and water. This section explains how soils affect tree growth and management in the county. Table 4 lists potential productivity and management problems of the soils in Greenville County.

The first column of table 4 lists the woodland suitability group and gives a brief description of the soils in the group. Each group is made up of soils that are suited to the same kinds of trees, that need about the same kind of management to produce these trees, and that have about the same potential productivity.

Each woodland suitability group is identified by a three-element symbol. The first element is an Arabic numeral that indicates the woodland suitability class. It expresses the relative productivity of the soils. The numeral 1 indicates very high potential productivity; 2, high; 3, moderately high; 4, moderate; and 5, low.

The second element is a lowercase letter that indicates the suitability subclass. It expresses an important soil property that imposes moderate or severe hazards or limitations in managing the soils for wood crops.

The letter *x* (stoniness or rockiness) shows soils that have restrictions or limitations for woodland use or management because of stones or rocks.

The letter *w* (excessive wetness) shows soils in which excessive water, either seasonally or year long, causes significant limitations for woodland use or management. These soils have restricted drainage, a high water table, or an overflow hazard that adversely affects stand development or management.

The letter *d* (restricted rooting depth) shows soils that have restrictions or limitations for woodland use or management because of restricted rooting depths. The soils are shallow to hard rock, a hardpan, or other layers that restrict roots.

The letter *c* (clayey soils) shows soils that have restrictions or limitations for woodland use or management because of the kind or amount of clay in the upper part of the soil profile (the subscript "e" indicates that the condition is the result of severe erosion).

[3] By GEORGE E. SMITH, JR., woodland conservationist, Soil Conservation Service.

soils for principal crops

Wheat	Oats	Pasture	
		Winter fescue and white clover	Summer common bermudagrass
Well suited	Well suited	Well suited	Fairly well suited.
Fairly well suited	Fairly well suited	Fairly well suited	Fairly well suited.
Fairly well suited	Fairly well suited	Well suited	Fairly well suited.
Not well suited	Not well suited	Fairly well suited	Not well suited.
Fairly well suited	Not well suited	Fairly well suited	Not well suited.
Poorly suited	Not well suited	Not well suited	Not well suited.
Poorly suited	Not well suited	Well suited	Not well suited.
Poorly suited	Not well suited	Well suited	Not well suited.
Not well suited	Not well suited	Well suited	Well suited.
Poorly suited	Poorly suited	Fairly well suited	Fairly well suited.
Well suited	Well suited	Well suited	Well suited.
Well suited	Well suited	Well suited	Fairly well suited.
Fairly well suited	Fairly well suited	Well suited	Fairly well suited.
Not well suited	Fairly well suited	Fairly well suited	Fairly well suited.
Not well suited	Fairly well suited	Fairly well suited	Fairly well suited.
Poorly suited	Poorly suited	Well suited	Not well suited.
Poorly suited	Well suited	Well suited	Well suited.
Not well suited	Well suited	Fairly well suited	Well suited.
Fairly well suited	Fairly well suited	Well suited	Fairly well suited.
Not well suited	Not well suited	Fairly well suited	Fairly well suited.
Fairly well suited	Not well suited	Well suited	Poorly suited.
Fairly well suited	Fairly well suited	Well suited	Well suited.
Well suited	Well suited	Well suited	Well sulted.
Fairly well suited	Fairly well suited	Well suited	Well suited.
Not well suited	Not well suited	Fairly well suited	Fairly well suited.
Not well suited	Not well suited	Fairly well suited	Fairly well suited.
Well suited	Well suited	Well suited	Well suited.
Fairly well suited	Fairly well suited	Well suited	Well suited.
Fairly well suited	Fairly well suited	Fairly well suited	Fairly well suited.
Not well suited	Fairly well suited	Fairly well suited	Fairly well suited.
Poorly suited	Not well suited	Fairly well suited	Not well suited.
Poorly suited	Poorly suited	Well suited	Poorly suited.
Fairly well suited	Fairly well suited	Well suited	Well suited.

The letter *s* (sandy soils) shows sandy soils that have little or no clay accumulation in the subsoil and that have moderate to severe restrictions or limitations for woodland use or management. These soils impose equipment limitations, have low moisture-holding capacity, and normally are low in available plant nutrients.

The letter *r* (relief or slope) shows soils that have restrictions or limitations for woodland use or management because of slope.

The letter *o* (slight or no limitations) shows soils that have no significant restrictions or limitations for woodland use or management.

Some kinds of soil may have more than one set of subclass characteristics. Priority in placing each kind of soil into a subclass is in the order that the subclass characteristics are listed in the foregoing paragraph.

The third element in the symbol indicates the degree of hazards or limitations and the general suitability of the soils for certain kinds of trees. The three management problems considered are the erosion hazard, equipment limitations, and seedling mortality.

The numeral 1 indicates soils that have slight management problems, or none, and are suited to needleleaf trees; 2 indicates soils that have one or more moderate management problems and are suited to needleleaf trees; 3 indicates soils that have one or more severe management problems and are suited to needleleaf trees; 4 indicates soils that have slight management problems, or none, and are suited to broadleaf trees; 5 indicates soils that have one or more moderate management problems and are suited to broadleaf trees; 6 indicates soils that have one or more severe management problems and are suited to broadleaf trees; 7 indicates soils that have slight management problems, or none, and are suited to either needleleaf or broadleaf trees; 8 indicates soils that have one or more moderate management problems and are suited to either needleleaf or broadleaf trees; 9 indicates soils that have one or more severe management problems and are suited to either needleleaf or broadleaf trees.

The second column of table 4 lists some of the commercially important trees that are suited to the soils. These are trees that woodland managers generally favor in intermediate or improvement cuttings.

The third column shows the potential productivity of these trees in terms of site index. The site index is the average height of dominant trees, in feet, at age 30 for cottonwood; at age 35 for sycamore; and at age 50 for all other species or types.

The fourth column contains a list of trees suitable for planting for commercial wood production.

The management problems, including equipment limitations, seedling mortality, and erosion hazard, are evaluated in the brief description of the woodland

TABLE 3.—*Predicted average yields per acre of principal crops grown under a high level of management on selected soils*

[Absence of data indicates that the crop is not suited to the particular soil or generally is not grown]

Soil	Corn	Soybeans	Cotton	Wheat	Oats	Pasture	
						Fescue and white clover	Common bermudagrass
	Bu	*Bu*	*Lb of lint*	*Bu*	*Bu*	*A.U.M.*[1]	*A.U.M.*[1]
Appling sandy loam, 2 to 6 percent slopes	80	35	650	55	85	6.0	5.5
Appling sandy loam, 6 to 10 percent slopes	70	30	575	50	75	5.5	5.5
Brevard fine sandy loam, 6 to 10 percent slopes	85	35	----	50	60	6.0	4.5
Brevard fine sandy loam, 10 to 15 percent slopes	75	25	----	40	50	5.5	4.0
Brevard sandy clay loam, 2 to 10 percent slopes, eroded	70	25	----	45	55	5.5	4.0
Brevard sandy clay loam, 10 to 25 percent slopes, eroded	----	----	----	----	----	5.0	4.0
Brevard-Evard Complex, 15 to 25 percent slopes	----	----	----	----	----	5.0	4.5
Buncombe loamy sand, 2 to 5 percent slopes	55	----	----	----	50	3.0	3.0
Cartecay and Chewacla soils	75	30	----	----	40	6.5	3.0
Cartecay and Toccoa soils	75	25	----	----	40	7.0	3.0
Cataula sandy loam, 2 to 6 percent slopes, eroded	50	30	550	35	40	6.0	6.0
Cataula sandy loam, 6 to 10 percent slopes, eroded	35	20	400	30	30	5.0	5.0
Cecil sandy loam, 2 to 6 percent slopes	90	40	750	60	90	7.0	6.0
Cecil sandy loam, 6 to 10 percent slopes	80	35	700	55	85	6.5	5.5
Cecil sandy loam, 10 to 15 percent slopes	70	30	550	50	75	6.0	5.0
Cecil clay loam, 2 to 6 percent slopes, eroded	65	30	500	40	70	5.5	5.0
Cecil clay loam, 6 to 10 percent slopes, eroded	55	25	425	35	60	5.0	4.5
Chewacla soils	90	30	----	----	30	7.0	3.0
Congaree fine sandy loam	100	40	----	----	80	7.0	7.0
Durham loamy sand, 2 to 6 percent slopes	80	30	650	40	80	5.5	6.0
Edneyville fine sandy loam, 6 to 10 percent slopes	75	30	----	50	60	6.0	5.5
Edneyville fine sandy loam, 10 to 15 percent slopes	60	25	----	35	45	5.0	5.0
Edneyville fine sandy loam, 15 to 25 percent slopes	----	----	----	----	----	4.5	4.5
Haywood loam, 6 to 15 percent slopes	90	30	----	50	55	6.5	2.0
Helena sandy loam, 2 to 6 percent slopes	65	35	550	45	70	6.5	6.5
Hiwassee sandy loam, 2 to 6 percent slopes	85	45	750	55	80	7.0	7.0
Hiwassee sandy loam, 6 to 10 percent slopes	75	35	550	45	70	6.5	6.5
Hiwassee sandy loam, 10 to 15 percent slopes	50	25	400	35	55	5.5	5.5
Hiwassee sandy loam, 15 to 25 percent slopes	----	----	----	----	----	5.0	5.0
Hiwassee clay loam, 2 to 6 percent slopes, eroded	60	30	450	35	55	5.0	5.0
Hiwassee clay loam, 6 to 15 percent slopes, eroded	----	----	----	----	----	5.0	4.5
Louisburg loamy sand, 6 to 15 percent slopes	----	----	----	----	----	3.0	3.0
Madison sandy loam, 2 to 6 percent slopes	85	40	750	55	90	6.5	6.5
Madison sandy loam, 6 to 10 percent slopes	75	35	650	50	75	6.0	6.0
Madison sandy loam, 10 to 15 percent slopes	65	30	500	45	60	5.5	5.5
Madison sandy loam, 15 to 25 percent slopes	----	----	----	----	----	5.0	5.0
Madison clay loam, 6 to 10 percent slopes, eroded	50	25	400	35	60	5.0	5.0
Madison clay loam, 10 to 15 percent slopes, eroded	----	----	----	----	----	4.0	4.0
Pacolet sandy loam, 15 to 25 percent slopes	----	----	----	----	----	5.0	5.0
Pacolet clay loam, 10 to 15 percent slopes, eroded	----	----	----	----	----	4.0	4.5
Porters loam, 6 to 15 percent slopes	50	20	----	25	45	4.5	3.5
Saluda and Edneyville soils, 15 to 25 percent slopes	----	----	----	----	----	4.0	3.5
Wehadkee soils	55	25	----	----	----	6.0	----
Wickham sandy loam, 2 to 6 percent slopes	80	40	600	50	75	6.5	6.5

[1] Animal-unit-month is a term used to express the carrying capacity of pasture. It is the number of animal units per acre a pasture can carry each month without injury to the sod. An acre of pasture that provides 1 month of grazing for 1 cow, 1 horse, 5 sheep, or 5 goats has a carrying capacity of 1 animal-unit-month.

suitability groups given in the first column of table 4.

Equipment limitations reflect the soil conditions that restrict the use of equipment normally used in managing or harvesting the tree crop. A rating of *slight* indicates equipment use is seldom limited to kind or to time of year. A rating of *moderate* indicates a seasonal limitation or need for modification in methods or equipment. A rating of *severe* indicates the need for specialized equipment or operations.

Seedling mortality indicates the degree of expected mortality of planted seedlings when plant competition is not a limiting factor. Normal rainfall, good planting stock, and proper planting are assumed. A rating of *slight* indicates that expected seedling mortality is less than 25 percent; a rating of *moderate* indicates expected mortality of 25 to 50 percent; and a rating of *severe* indicates expected seedling mortality of more than 50 percent.

Erosion hazard indicates the probable loss of soil material through erosion where trees have been cut or where the soil is exposed along roads, trails, firebreaks or log-yarding areas. A rating of *slight* indicates that

TABLE 4.—*Woodland suitability groups of soils, potential productivity, and species suitable for planting*

[Urban land and Rock land are not placed in a woodland group, because the soil material in these land types is too variable]

Woodland suitability groups and map symbols	Potential productivity		Species suitable for planting
	Tree species	Site class[1]	
Group 1o7: Well-drained soils that are subject to flooding but have very high potential productivity; no serious management problems; suited to broadleaf or needleleaf trees, or both. Toccoa soil in Cb; Cw. For Cartecay soil in Cb, see group 2w8.	Black cherry	90	Loblolly pine, cherrybark oak, cottonwood, sweetgum, sycamore, black walnut, and yellow-poplar.
	Black walnut	100	
	Cottonwood	110	
	Green ash	90	
	Loblolly pine	90	
	Shortleaf pine	80	
	Sugarberry	80	
	Sweetgum	100	
	Sycamore	90	
	Water oaks	90	
	Yellow-poplar	110	
Group 1w8: Seasonally wet soils that have very high potential productivity; moderate equipment restrictions and slight to moderate seedling mortality; suited to broadleaf or needleleaf trees, or both. Chewacla soil in Ca; Cv. For Cartecay soil in Ca, see group 2w8.	Cottonwood	100	Cottonwood, loblolly pine, sweetgum, sycamore, yellow-poplar, cherrybark oak, and eastern white pine [2].
	Green ash	100	
	Loblolly pine	100	
	Red oaks	90	
	Sugarberry	80	
	Blackgum	80	
	Sweetgum	100	
	Sycamore	90	
	Water oaks	90	
	Yellow-poplar	100	
Group 1w9: Excessively wet soils that have very high potential productivity; severe equipment restrictions and moderate to severe seedling mortality; suited to broadleaf or needleleaf trees, or both. Wd.	Cottonwood	90	Cherrybark oak, cottonwood, green ash, sweetgum, sycamore, loblolly pine, and yellow-poplar.
	Green ash	100	
	Loblolly pine	100	
	Red maple	90	
	Sweetgum	90	
	Sycamore	90	
	Water oaks	90	
	White ash	90	
	Yellow-poplar	100	
Group 2o7: Well-drained soils that have high productivity; no serious management problems; well suited to hardwoods and to pines or other conifers. BrC; BrD; BsC2; EdC; EdD; HaD; PrD.	Loblolly pine	80–90	White ash, Fraser fir, [2] northern red oak, loblolly pine,[3] Scotch pine,[2] shortleaf pine,[4] white pine, Norway spruce,[2] black walnut, yellow-poplar, and sycamore.
	Pitch pine	70	
	Shortleaf pine	70–80	
	Virginia pine	70–80	
	White pine	90	
	Upland oaks	70–80	
	Yellow-poplar	100+	
Group 2s8: Sandy soils that have high productivity; moderate equipment restrictions and seedling mortality; suited to broadleaf or needleleaf trees, or both. BwB.	Cottonwood	100	Cottonwood, sycamore, and loblolly pine.
	Black willow	----------	
	Sycamore	90	
	Sweetgum	90	
Group 2w8: Seasonally wet soils that have high productivity; moderate equipment restrictions and slight to moderate seedling mortality; suited to broadleaf or needleleaf trees, or both. Cartecay soil in Ca and Cb. For Chewacla soil in Ca, see group 1w8. For Toccoa soil in Cb, see group 1o7.	Loblolly pine	90	Loblolly pine, sweetgum, sycamore, yellow-poplar, and cottonwood.
	Sweetgum	90	
	Yellow-poplar	100	
	Red oaks	80	
	White oaks	80	
	Sycamore	90	
Group 2r8: Well-drained soils that have high productivity; moderate equipment limitations and moderate erosion hazard because of slope; well suited to hardwoods and to pines or other conifers. BsE2; Brevard soil in BvE; EdE; EeF; Brevard soil in EVF; FaF; PrF; Edneyville soil in SeE and SeF. For Evard soil in BvE and EVF, see group 3r2. For Saluda soil in SeE and SeF, see group 3d2.	Loblolly pine	80–90	White ash, Fraser fir,[2] northern red oak, loblolly pine,[3] Scotch pine,[2] shortleaf pine,[4] white pine, Norway spruce,[2] black walnut, and yellow-poplar.
	Pitch pine	70	
	Shortleaf pine	70–80	
	Virginia pine	70–80	
	White pine	90	
	Upland oaks	70–80	
	Yellow-poplar	100+	
Group 2r9: Well-drained soils that have high productivity; severe equipment limitations and severe erosion hazard because of slope; suited to hardwoods and pines or other conifers. Edneyville soil in EHG; PrG; Edneyville soil in SFG. For Ashe soil in EHG, see group 3r3. For Saluda soil in SFG, see group 3d3.	Loblolly pine	80–90	White ash, Fraser fir,[2] northern red oak, loblolly pine,[3] Scotch pine,[2] shortleaf pine,[4] white pine, Norway spruce,[2] and yellow-poplar.
	Pitch pine	70	
	Shortleaf pine	70–80	
	Virginia pine	70–80	
	White pine	90	
	Upland oaks	70–80	
	Yellow-poplar	100+	

See footnotes at end of table.

TABLE 4.—*Woodland suitability groups of soils, potential productivity, and species suitable for planting*—Continued

Woodland suitability groups and map symbols	Potential productivity		Species suitable for planting
	Tree species	Site class[1]	
Group 3o7: Well-drained to excessively drained soils that have moderately high productivity; no serious management problems; suited to broadleaf or needleleaf trees, or both. ApB; ApC; CdB2; CdC2; CeB; CeC; CeD; ClB2; ClC2; CuC; DuB; HeB; HeC; HeD; HlB2; HlD2; LuD; McB; McC; McD; MdC2; MdD2; PdD2; WhB.	Loblolly pine Shortleaf pine Red oaks White oaks Yellow-poplar Virginia pine	80 70 70–80 70–80 90 70+	Loblolly pine, Virginia pine, yellow-poplar, and white pine.
Group 3r2: Well-drained to somewhat excessively drained soils that have moderately high productivity; moderate equipment limitations and moderate erosion hazard because of slope; best suited to pines or other conifers. Ashe soil in AvF; Brevard soil in BvE and EVF. For Cleveland soil in AvF, see group 4d3. For Evard soil in BvE and EVF, see group 2r8.	Loblolly pine Shortleaf pine Virginia pine White pine	80 60–70 70 80+	Loblolly pine,[3] Scotch pine,[2] shortleaf pine,[4] Virginia pine, white pine, and Norway spruce.[2]
Group 3r3: Well-drained to somewhat excessively drained soils that have moderately high productivity; severe equipment limitations and severe erosion hazard because of slope; best suited to pines or other conifers. Ashe soil in ASG and EHG; TdG. For Cleveland soil in ASG, see group 4d3. For Edneyville soil in EHG, see group 2r9.	Loblolly pine Shortleaf pine Virginia pine White pine	80 60–70 70 80+	Loblolly pine,[3] Scotch pine,[2] shortleaf pine,[4] Virginia pine, white pine, and Norway spruce.[2]
Group 3r8: Well-drained to excessively drained soils that have moderately high productivity; moderate equipment restrictions and moderate erosion hazard because of slope; suited to broadleaf or needleleaf trees, or both. CuE; HeE; LuF; McE; PcE; PcF; PdE2.	Loblolly pine Shortleaf pine Yellow-poplar Red oaks White oaks Virginia pine	80 70 90 70–80 70–80 70+	Loblolly pine, yellow-poplar, northern red oak, white pine, and Virginia pine.
Group 3d2: Shallow soils that have moderately high productivity; moderate seedling mortality and slight to moderate erosion hazard and equipment limitations; best suited to conifers. Saluda soil in SeE and SeF. For Edneyville soil in SeE and SeF, see group 2r8.	Loblolly pine Pitch pine Shortleaf pine Virginia pine White pine Upland oaks Yellow-poplar	80 70 60 70 90 70 80	Fraser fir,[2] loblolly pine, Virginia pine, Scotch pine,[2] shortleaf pine, and Norway spruce.[2]
Group 3d3: Shallow soils that have moderately high productivity; severe erosion hazard and severe equipment limitations because of slope; best suited to conifers. Saluda soil in SFG. For Edneyville soil in SFG, see group 2r9.	Loblolly pine Pitch pine Shortleaf pine Virginia pine White pine Upland oaks Yellow-poplar	80 70 60 70 90 70 80	Fraser fir,[2] loblolly pine, Virginia pine, Scotch pine,[2] shortleaf pine, and Norway spruce.[2]
Group 3w8: Seasonally wet soils that have moderately high productivity; moderate equipment restrictions and slight to moderate seedling mortality; suited to broadleaf or needleleaf trees, or both. HbB.	Loblolly pine Yellow-poplar Red oaks Sweetgum White oaks Shortleaf pine	80 90 70 80 70 70	Loblolly pine, sycamore, yellow-poplar, and sweetgum.
Group 3x3: Somewhat excessively drained soils that have moderately high productivity; severe equipment limitations because of stoniness and slope; severe erosion hazard; best suited to pines or other conifers. Ashe soil in ATG. For Cleveland soil in ATG, see group 4x3.	Loblolly pine Shortleaf pine Virginia pine White pine	80 60–70 70 80+	Loblolly pine,[3] Scotch pine,[2] shortleaf pine,[4] Virginia pine, white pine, and Norway spruce.[2]
Group 4x3: Shallow soils that have moderate productivity; severe equipment limitations and severe erosion hazard; moderate seedling mortality and moderate windthrow hazard because of stoniness, slope, or shallowness; best suited to pines. Cleveland soil in ATG. For Ashe soil in ATG, see group 3x3.	Loblolly pine Pitch pine Shortleaf pine Virginia pine White pine	70 70 60 60–70 70	Loblolly pine,[3] pitch pine, Scotch pine,[2] shortleaf pine,[4] and white pine.
Group 4d3: Shallow soils that have moderate productivity; moderate to severe equipment limitations; severe erosion hazard; moderate seedling mortality and moderate windthrow hazard because of shallowness or slope, or both; best suited to pines. Cleveland soil in ASG, AvF, and RoG. For Ashe soil in ASG, see group 3r3. For Ashe soil in AvF, see group 3r2.	Loblolly pine Pitch pine Shortleaf pine Virginia pine White pine	70 70 60 60–70 70	Loblolly pine,[3] pitch pine, shortleaf pine,[4] Scotch pine,[2] and white pine.

See footnotes at end of table.

TABLE 4.—*Woodland suitability groups of soils, potential productivity, and species suitable for planting*—Continued

Woodland suitability groups and map symbols	Potential productivity		Species suitable for planting
	Tree species	Site class[1]	
Group 4c3e: Severely eroded soils that have moderate productivity; severe erosion hazard and severe equipment limitations; moderate seedling mortality because of slope; best suited to needleleaf trees. PfE3.	Loblolly pine Shortleaf pine Virginia pine Red oaks White oaks	70 60 60 70 60	Loblolly pine and Virginia pine.

[1] Site classes are based on site indexes at 50 years of age for all tree species except cottonwood and sycamore (at ages 30 for cottonwood and 35 for sycamore).
[2] For Christmas tree production.
[3] Loblolly pine is not generally recommended for planting in Blue Ridge area except at elevations below 2,000 feet.
[4] Shortleaf pine is generally not recommended for planting at elevations above 3,000 feet.

problems of erosion control are unimportant. A rating of *moderate* indicates some attention must be given to prevent unnecessary soil erosion. A rating of *severe* indicates that intensive treatments or special equipment and methods of operation should be used to minimize soil erosion. The potential erosion hazard is based on slope, soil depth, erodibility, and soil loss tolerance.

Woodland yields

The site index is a satisfactory method of expressing productivity of the soil for tree growth. Figures 12 and 13 show average annual growth for natural stands of loblolly pine (*2*). Figure 14 shows average annual growth for southern hardwoods (*6*). Figure 15 shows merchantable volume of loblolly pine plantations (*4*). The kind of cutting and estimated yields of upland hardwoods is given in table 5.

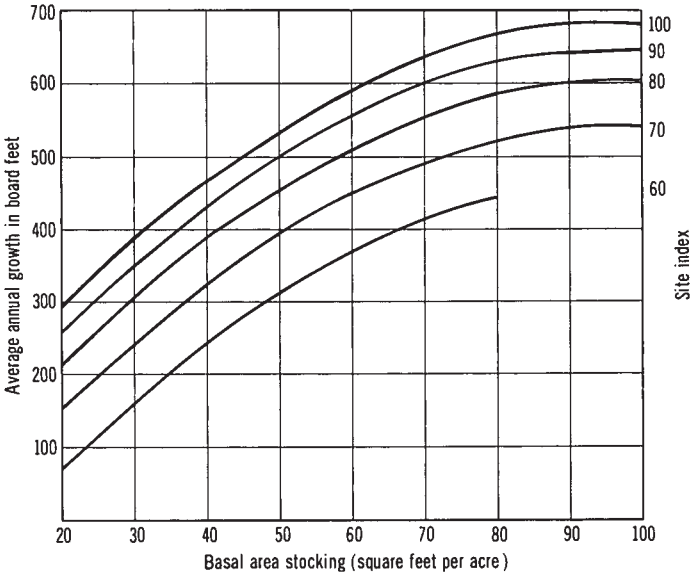

***Figure 12.*—Board-foot increment by site classes and stocking at 50 years of age (*2*).**

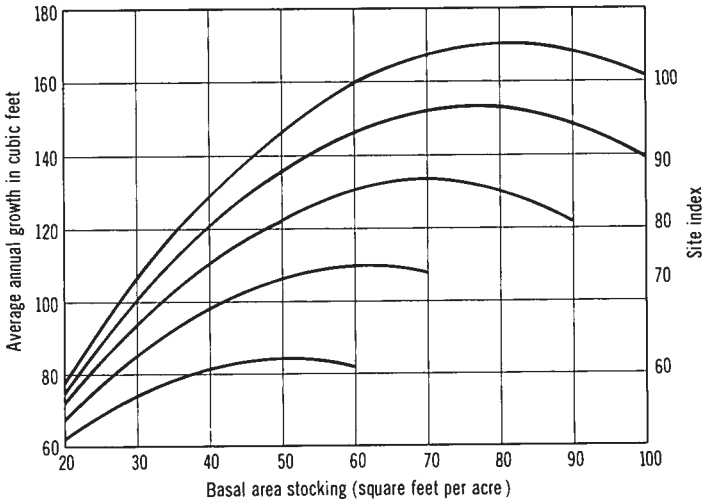

***Figure 13.*—Cubic-foot increment by site classes and stockings at 20 years of age (*2*).**

Use of the Soils for Wildlife Habitat [4]

Soils directly influence the kinds and amount of vegetation and the amount of water available, and in this way they indirectly influence the kinds of wildlife that can live in an area. Soil properties that affect the growth of wildlife habitat are the thickness of soil useful to crops, the texture of the surface layer, available water capacity to a 40-inch depth, wetness, surface stoniness or rockiness, flood hazard, slope, and permeability of the soil to air and water.

In table 6 (page 44), each soil in Greenville County is rated as to its suitability for three groups or kinds of wildlife. These ratings refer only to the siutability of the soil and do not take into account the climate, the present use of the soil, or the distribution of wildlife and human populations. The suitability of individual sites has to be determined by onsite inspection.

A rating of well suited means wildlife habitats generally are easily created, improved, and maintained.

[4] By W. W. NEELY, biologist, Soil Conservation Service.

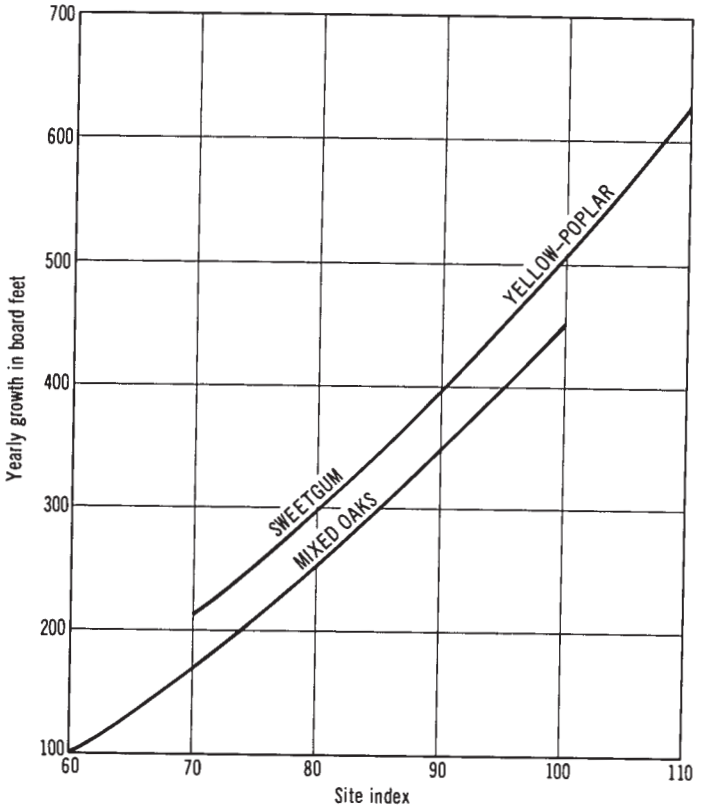

***Figure 14.*—Average yearly growth per acre in board feet for well-stocked, even-aged southern hardwood stands to age 60 (*6*).**

Few or no limitations affect management in this category, and satisfactory results are expected when the soil is used for the prescribed purpose.

A rating of suited means wildlife habitats can be created, improved, or maintained in most places. Moderate intensity of management and fairly frequent attention may be required for satisfactory results, however.

A rating of poorly suited means limitations for the designated use are rather severe. Habitats can be created, improved, or maintained in most places, but management is difficult and requires intensive effort.

A rating of unsuited means that limitations for wildlife habitat are very severe and that unsatisfactory results are to be expected. It is either impossible or impractical to create, improve, or maintain habitats on soils in this category.

Openland wildlife are quail, doves, cottontail rabbit, fox, meadowlark, field sparrow, and other birds and animals that normally live on cropland, pasture, meadows, lawns, and other openland areas where grasses, herbs, and shrubby plants grow. Factors affecting the rating of suitability of a soil for openland wildlife are the soil's suitability for grain and seed crops, grasses and legumes, and wild herbaceous upland plants. In general, the greater the slope or amount of erosion, the less suitable a soil is for openland wildlife.

Woodland wildlife are squirrel, woodcock, thrush, vireo, deer, raccoon, wild turkey, and other birds and mammals that normally live in wooded areas where

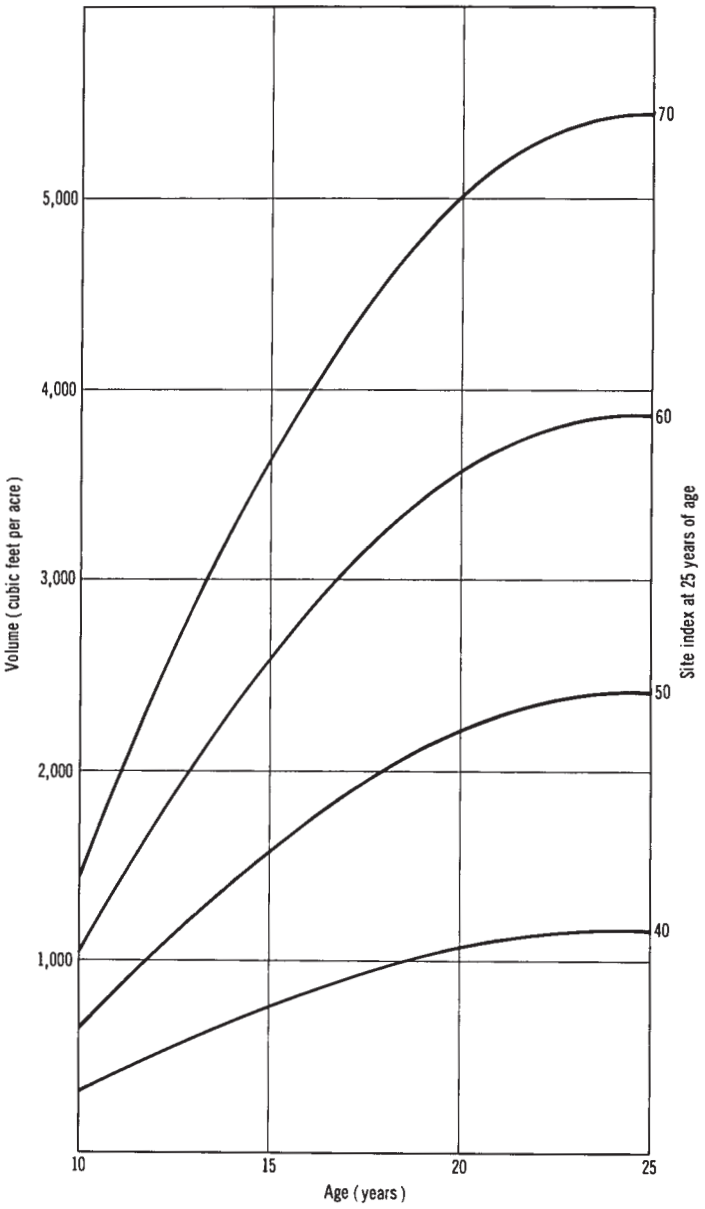

***Figure 15.*—Merchantable volume to 3-inch top per acre for loblolly pine plantations. The stocking rate is 700 trees per acre (*4*).**

hardwood trees and shrubs and coniferous trees grow. Ratings indicate that the better a soil is suited to the growth of hardwood trees, hardwood woody plants, and wild herbaceous plants, the better the soil is suited to species of woodland wildlife. Slope has less to do with suitability of a soil for this kind of wildlife. In some instances, soils that produce vigorous growth in pines may be rated downward in suitability for woodland wildlife.

Wetland wildlife are ducks, geese, rail, heron, shore birds, mink, and other birds and mammals that normally live in wet areas, marshes, and swamps. Suitability of a soil for shallow water developments and for the growth of wetland food and cover plants are the major factors affecting the rating of a soil's suitability for wetland wildlife.

TABLE 5.—*Kind of cutting and estimated yields from well-stocked, even-aged stands of upland hardwoods managed for pulpwood (3)*

Kind of cutting	Average stand diameter	Average stand age	Average volume per acre [1]			
			Before this cut	This cut	After this cut	Cumulative cut
	Inches	*Years*	*Cords*	*Cords*	*Cords*	*Cords*
All sites:						
Reproduction cutting	0	0	0	0	0	0
Precommercial thinning	1–3	10	0	0	0	0
Site class 40 (10-year cutting cycle):						
Commercial thinning	6	40	9	3	6	3
Commercial thinning	8	50	17	4	13	7
Harvest cut	10	60	23	23	0	30
Site class 50 (9-year cutting cycle):						
Commercial thinning	6	36	11	4	7	4
Commercial thinning	8	45	19	5	14	9
Harvest cut	10	54	26	26	0	35
Site class 60 (8-year cutting cycle):						
Commercial thinning	6	32	14	5	9	5
Commercial thinning	8	40	22	6	16	11
Harvest cut	10	48	27	27	0	38
Site class 70 (7-year cutting cycle):						
Commercial thinning	6	28	18	6	12	6
Commercial thinning	8	35	22	7	15	13
Harvest cut	10	42	28	28	0	41
Site class 80 (6-year cutting cycle):						
Commercial thinning	6	24	18	6	12	6
Commercial thinning	8	30	24	7	17	13
Harvest cut	10	36	29	29	0	42

[1] Volume of merchantable wood to a 4-inch top.

Engineering Uses of the Soils [5]

This section is useful to those who need information about soils used as structural material or as foundation upon which structures are built. Among those who can benefit from this section are planning commissions, town and city managers, land developers, engineers, contractors, and farmers.

Among properties of soils highly important in engineering are permeability, strength, compaction characteristics, soil drainage condition, shrink-swell potential, grain size, plasticity, and soil reaction. Also important are depth to the water table, depth to bedrock, and soil slope. These properties, in various degrees and combinations, affect construction and maintenance of roads, airports, pipelines, foundations for small buildings, irrigation systems, ponds and small dams, and systems for disposal of sewage and refuse.

Information in this section of the soil survey can be helpful to those who—

1. Select potential residential, industrial, commercial, and recreational areas.
2. Evaluate alternate routes for roads, highways, pipelines, and underground cables.
3. Seek sources of gravel, sand, or clay.
4. Plan farm drainage systems, irrigation systems, ponds, terraces, and other structures for controlling water and conserving soil.
5. Correlate performance of structures already built with properties of the kinds of soil on which they are built, for the purpose of predicting performance of structures on the same or similar kinds of soil in other locations.
6. Predict the trafficability of soils for cross-country movement of vehicles and construction equipment.
7. Develop preliminary estimates pertinent to construction in a particular area.

Most of the information in this section is presented in tables 7, 8, and 9, which show, respectively, results of engineering laboratory tests on soil samples; several estimated soil properties significant to engineering; and interpretations for various engineering uses.

This information, along with the soil map and other parts of this publication, can be used to make interpretations in addition to those given in table 9, and it also can be used to make other useful maps.

This information, however, does not eliminate need for further investigations at sites selected for engineering works, especially works that involve heavy

[5] By RICHARD G. CHRISTOPHER, III, area engineer, Soil Conservation Service.

TABLE 6.—*Soil suitability for wildlife habitat*

Soil series and map symbols	Kinds of wildlife		
	Openland	Woodland	Wetland
Appling:			
ApB	Well suited	Well suited	Unsuited.
ApC	Suited	Well suited	Unsuited.
Ashe-Cleveland:			
ASG, ATG, AvF	Unsuited	Poorly suited	Unsuited.
Brevard:			
BrC	Suited	Well suited	Unsuited.
BrD, BsC2	Poorly suited	Suited	Unsuited.
BsE2, BvE	Unsuited	Suited	Unsuited.
Buncombe: BwB	Poorly suited	Suited	Unsuited.
Cartecay and Chewacla: Ca	Poorly suited	Suited	Suited.
Cartecay and Toccoa: Cb	Poorly suited	Suited	Suited.
Cataula:			
CdB2	Suited	Suited	Unsuited.
CdC2	Poorly suited	Suited	Unsuited.
Cecil:			
CeB	Well suited	Well suited	Unsuited.
CeC	Suited	Well suited	Unsuited.
CeD	Poorly suited	Suited	Unsuited.
CIB2	Suited	Suited	Unsuited.
CIC2	Poorly suited	Suited	Unsuited.
Cecil-Urban land: CuC, CuE. Onsite investigation is needed.			
Chewacla: Cv	Poorly suited	Well suited	Suited.
Congaree: Cw	Suited	Well suited	Suited.
Durham: DuB	Well suited	Well suited	Unsuited.
Edneyville:			
EdC	Suited	Suited	Unsuited.
EdD	Poorly suited	Suited	Unsuited.
EdE	Unsuited	Suited	Unsuited.
EeF	Unsuited	Poorly suited	Unsuited.
Edneyville and Ashe: EHG	Unsuited	Poorly suited	Unsuited.
Evard-Brevard: EVF	Unsuited	Suited	Unsuited.
Fannin: FaF	Unsuited	Suited	Unsuited.
Haywood: HaD	Suited	Well suited	Unsuited.
Helena: HbB	Suited	Well suited	Unsuited.
Hiwassee:			
HeB	Well suited	Well suited	Unsuited.
HeC	Suited	Well suited	Unsuited.
HeD, HID2	Poorly suited	Suited	Unsuited.
HeE	Unsuited	Suited	Unsuited.
HIB2	Suited	Suited	Unsuited.
Louisburg:			
LuD	Unsuited	Suited	Unsuited.
LuF	Unsuited	Poorly suited	Unsuited.
Madison:			
McB	Well suited	Well suited	Unsuited.
McC	Suited	Well suited	Unsuited.
McD, MdC2	Poorly suited	Suited	Unsuited.
McE, MdD2	Unsuited	Suited	Unsuited.
Pacolet:			
PcE, PdD2	Unsuited	Suited	Unsuited.
PcF, PdE2, PfE3	Unsuited	Poorly suited	Unsuited.
Porters:			
PrD	Poorly suited	Suited	Unsuited.
PrF, PrG	Unsuited	Poorly suited	Unsuited.
Rock land-Cleveland: RoG	Unsuited	Onsite investigation is needed.	Unsuited.
Saluda and Edneyville:			
SeE	Unsuited	Suited	Unsuited.
SeF, SFG	Unsuited	Poorly suited	Unsuited.
Talladega: TdG	Unsuited	Poorly suited	Unsuited.
Urban land: Ur. Onsite investigation is needed.			
Wehadkee: Wd	Unsuited	Well suited	Suited.
Wickham: WhB	Well suited	Well suited	Unsuited.

loads or that require excavations to depths greater than those shown in the tables, generally depths greater than 6 feet. Also, inspection of sites, especially the small ones, is needed because many delineated areas of a given soil mapping unit may contain small areas of other kinds of soil that have strongly contrasting properties and different suitabilities or limitations for soil engineering.

Some of the terms used in this soil survey have special meaning to soil scientists that is not known to all engineers. The Glossary defines many of these terms commonly used in soil science.

Engineering soil classification systems

The two systems most commonly used in classifying samples of soils for engineering are the Unified system (*9*) used by the SCS engineers, Department of Defense, and others, and the AASHO system (*1*) adopted by the American Association of State Highway Officials.

In the Unified system soils are classified according to particle-size distribution, plasticity, liquid limit, and organic matter. Soils are grouped in 15 classes. There are eight classes of coarse-grained soils, identified as GW, GP, GM, GC, SW, SP, SM, and SC; six classes of fine-grained soils, identified as ML, CL, OL, MH, CH, and OH; and one class of highly organic soils, identified as Pt. Soils on the borderline between two classes are designated by symbols for both classes; for example, ML–CL.

The AASHO system is used to classify soils according to those properties that affect use in highway construction and maintenance. In this system, a soil is placed in one of seven basic groups ranging from A–1 through A–7 on the basis of grain-size distribution, liquid limit, and plasticity index. In group A–1 are gravelly soils of high bearing strength, or the best soils for subgrade (foundation). At the other extreme, in group A–7, are clay soils that have low strength when wet and that are the poorest soils for subgrade. Where laboratory data are available to justify a further breakdown, the A–1, A–2, and A–7 groups are divided as follows: A–1–a, A–1–b, A–2–4, A–2–5, A–2–6, A–2–7, A–7–5 and A–7–6. As additional

refinement, the engineering value of a soil material can be indicated by a group index number. Group indexes range from 0 for the best material to 20 or more for the poorest. The AASHO classification for tested soils, with group index numbers in parentheses, is shown in table 7; the estimated classification, without group index numbers, is given in table 8 for all soils mapped in the survey area.

Soil test data

Table 7 contains engineering test data for some of the major soil series in Greenville County. These tests were made to help evaluate the soils for engineering purposes. The engineering classifications given are based on data obtained by mechanical analyses and by tests to determine liquid limits and plastic limits. The mechanical an alyses were made by combined sieve and hydrometer methods.

Moisture-density (or compaction) data are important in earthwork. If a soil material is compacted at successively higher moisture content, assuming that the compactive effort remains constant, the density of the compacted material increases until the *optimum moisture content* for that compactive effort is reached. After that, density decreases with increase in moisture content. The highest dry density obtained in the compactive test is termed *maximum dry density*. As a rule, maximum strength of earthwork is obtained for the compactive effort expended if the soil is compacted at near optimum moisture.

Liquid limit and plasticity index indicate the effect of water on the strength and consistence of soil material. As the moisture content of a clayey soil is increased from a dry state, the material changes from a semisolid to a plastic state. If the moisture content is further increased, the material changes from a plastic to a liquid state. The plastic limit is the moisture content at which the soil material changes from the semisolid to plastic state; and the liquid limit, from a plastic to a liquid state. The plasticity index is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which a soil material is plastic. In table 7, the data on liquid limit and plasticity index are based on tests of soil samples.

Soil properties significant to engineering

Several estimated soil properties significant in engineering are given in table 8 (page 48). These estimates are made for typical soil profiles, by layers sufficiently different to have different significance for soil engineering. The estimates are based on field observations made in the course of mapping, on test data for these and similar soils, and on experience with the same kinds of soil in other countries. Following are explanations of some of the columns in Table 8.

Depth to seasonal high water table is distance from the surface of the soil to the highest level that ground water reaches in the soil in most years.

Depth to bedrock is distance from the surface of the soil to the upper surface of the rock layer.

Soil texture is described in table 8 in the standard terms used by the Department of Agriculture. These terms take into account relative percentages of sand, silt, and clay in soil material that is less than 2 millimeters in diameter. "Loam," for example, is soil material that contains 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the soil contains gravel or other particles coarser than sand, an appropriate modifier is added, as for example, "gravelly loamy sand." "Sand," "silt," "clay," and some of the other terms used in USDA textural classification are defined in the Glossary of this soil survey.

Permeability is that quality of a soil that enables it to transmit water or air. It is estimated on the basis of those soil characteristics observed in the field, particularly structure and texture. The estimates in table 8 do not take into account lateral seepage or such transient soil features as plowpans and surface crusts.

Available water capacity is the ability of soils to hold water for use by most plants. It is commonly defined as the difference between the amount of water in the soil at field capacity and the amount at the wilting point of most crop plants.

Reaction is the degree of acidity or alkalinity of a soil, expressed in pH values. The pH value and terms used to describe soil reaction are explained in the Glossary.

Shrink-swell potential is the relative change in volume to be expected of soil material with changes in moisture content, that is, the extent to which the soil shrinks as it dries out or swells when it gets wet. Extent of shrinking and swelling is influenced by the amount and kind of clay in the soil. Shrinking and swelling of soils causes much damage to building foundations, roads, and other structures. A *high* shrink-swell potential indicates a hazard to maintenance of structures built in, on, or with material having this rating.

Engineering interpretations of the soils

The estimated interpretations in table 9 (page 54) are based on the engineering properties of soils shown in table 8, on text data for soils in this survey area and others nearby or adjoining, and on the experience of engineers and soil scientists with the soils of Greenville County. In table 9, ratings are used to summarize limitation or suitability of the soils for all listed purposes other than for drainage of cropland and pasture, irrigation, ponds and reservoirs, embankments, and terraces and diversions. For these particular uses, table 9 lists those soil features not to be overlooked in planning, installation, and maintenance.

Following are explanations of the columns in table 9.

Topsoil is used for topdressing an area where vegetation is to be established and maintained. Suitability is affected mainly by ease of working and spreading the soil material, as for preparing a seedbed; natural fertility of the material, or the response of plants when fertilizer is applied; and absence of substances toxic to plants. Texture of the soil material and the content of stone fragments are characteristics that affect suitability, but also considered in the ratings is damage that will result at the area from which topsoil is taken.

TABLE 7.—

[Tests performed by the soil testing laboratory, South Carolina State Highway Department in cooperation with U.S. Department Highway

Soil name and location	Parent material	South Carolina report No.	Depth	Mechanical analysis [1]			
				Percentage less than 3 inches passing sieve—			
				¾ inch	⅜ inch	No. 4 (4.7 mm)	No. 10 (2.0 mm)
			Inches				
Brevard fine sandy loam:							
1 mile northeast of Gap Creek Church on South Carolina Highway 41 (Modal).	Granite rock.	G–95540	2–7	----------	100	98	96
		G–95541	11–24	----------	----------	100	99
		G–95542	24–36	----------	----------	----------	100
Edneyville fine sandy loam:							
8,250 feet south southwest of Caesar's Head and 940 feet west of U.S. Highway 276 (Modal).	Granite and gneiss.	G–95574	2–9	----------	100	98	96
		G–95575	9–24	----------	----------	100	98
		G–95576	32–90	----------	100	98	96
Fannin fine sandy loam:							
1¼ miles east of broadcasting tower at Caesar's Head (Modal).	Sericitic schist and mica schist.	G–95567	2–5	100	97	94	87
		G–95568	5–24	100	99	96	91
		G–95569	24–33	99	89	85	75
		G–95570	33–38	100	99	94	89
Hiwassee sandy loam:							
80 feet south of Lynn Road and 600 feet west of the intersection of Waters and Lynn Roads (Modal).	Basic igneous rocks, hornblende gneiss.	G–95555	0–7	----------	----------	----------	100
		G–95556	21–41	----------	----------	----------	100
		G–95557	62–82	----------	----------	100	93
Madison sandy loam:							
75 feet off Griffin Road and ½ mile south of intersection of Griffin and Log Shoals Roads (Modal).	Micaceous schist and gneiss.	G–95528	0–6	100	98	96	91
		G–95529	10–33	----------	----------	----------	100
		G–95530	42–60	100	97	95	87
Pacolet sandy loam:							
750 feet east of Fork Shoals and 150 feet north of South Carolina Highway 154 (Modal).	Granite and gneiss.	G–95546	0–7	----------	100	98	95
		G–95547	7–15	----------	----------	----------	100
		G–95548	22–34	----------	----------	----------	100
Saluda sandy loam:							
2¼ miles south southeast of Caesar's Head (Modal).	Granite.	G–95534	2–6	----------	100	98	94
		G–95535	6–14	----------	100	99	96
		G–95536	18–24	----------	100	98	94

[1] Mechanical analysis according to AASHO Designation: T88–57 (*1*). Results by this procedure may differ somewhat from results obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHO procedure, the fine material is analyzed by the hydrometer method, and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method, and the material coarser than 2 millimeters in diameter is excluded from calculations of grain-size fractions. The mechanical analysis data used in this table are not suitable for naming textural classes for soils.

Road fill is soil material used in embankments for roads. The suitability ratings reflect (1) the predicted performance of soil after it has been placed in an embankment that has been properly compacted and provided with adequate drainage, and (2) the relative ease of excavating the material at borrow areas.

Farm pond reservoirs hold water behind a dam or embankment. Soils suitable for pond reservoir areas have low seepage, which is related to their permeability and depth to fractured or permeable bedrock or other permeable material.

Farm pond embankments require soil material resistant to seepage and piping and of favorable stability, shrink-swell potential, shear strength, and compactibility. Presence of stones or organic matter in a soil are among the factors that are unfavorable. Pond embankments are raised structures of soil material constructed across drainageways in order to impound water. These embankments are generally less than 20 feet high, are constructed of "homogeneous" soil material, and are compacted to medium density. Embankments having core- and shell-type construction are not rated in this table. Embankment foundation, reservoir area, and slope are assumed to be suitable for pond construction. Soil properties are considered that affect the embankment and the availability of borrow

Engineering test data

of Transportation, Federal Highway Administration, in accordance with standard procedures of the American Association of State Officials]

Mechanical analysis [1]—Continued			Liquid limit	Plasticity index	AASHO [3]	Unified [4]	Moisture-density data [5]	
Percentage less than 3 inches passing sieve—Continued		Percentage smaller than 0.005 mm [2]					Optimum moisture content	Maximum density
No. 40 (0.42 mm)	No. 200 (0.074 mm)							
			Percent				*Percent*	*Pounds per cubic foot*
69	36	24	33	1	A-4(0)	SM	17	103
82	50	39	36	10	A-4(3)	SM	17	110
83	44	32	34	10	A-4(2)	SM	15	110
74	23	11	----------	(6)	A-2-4(0)	SM	12	116
74	39	29	36	10	A-4(1)	SM	15	107
64	20	8	(6)	(6)	A-2-4(0)	SM	13	113
81	27	16	----------	(6)	A-2-4(0)	SM	23	93
76	32	18	37	(6)	A-2-4(0)	SM	22	98
43	15	10	----------	(6)	A-1-b(0)	SM	14	111
60	9	2	----------	(6)	A-3(0)	SM	13	100
78	38	26	22	6	A-4(1)	SM	17	119
83	59	52	45	14	A-7-5(7)	ML	21	101
60	25	18	52	6	A-2-5	SM	20	100
60	33	22	22	3	A-2-4(0)	SM	11	120
83	63	55	48	13	A-7-5(8)	ML	20	106
53	40	34	45	8	A-5(1)	SM	20	102
66	31	19	30	3	A-2-4(0)	SM	15	108
94	68	61	48	16	A-7-5(10)	ML	25	96
80	46	37	47	15	A-7-5(4)	SM	22	98
70	29	17	29	4	A-2-4(0)	SM	17	112
65	32	21	36	7	A-2-4(0)	SM	14	112
52	18	8	----------	(6)	A-2-4(0)	SM	13	112

[2] Test data not available on 0.05 millimeter, 0.02 millimeter, and 0.002 millimeter size.
[3] Based on AASHO Designation M145-661(*1*).
[4] Based on the Unified Soil Classification System: (*9*)
[5] Based on AASHO Designation: T99-57 (*1*).
[6] Nonplastic.

material. The best soils have good slope stability, low permeability, slight compressibility under load, and good resistance to piping and erosion. The best borrow material is free of stones or rocks and is thick enough for easy excavation.

Farm drainage of cropland and pasture is affected by such soil properties as permeability, texture, and structure; depth to claypan, rock, or other layers that influence rate of water movement; depth to the water table; slope; stability in ditchbanks; susceptibility to stream overflow; salinity or alkalinity; and availability of outlets for drainage.

Sprinkler irrigation of a soil is affected by such features as slope; susceptibility to stream overflow, water erosion, or soil blowing; soil texture; content of stones; accumulations of salts and alkali; depth of root zone; rate of water intake at the surface; permeability of soil layers below the surface layer and in fragipans or other layers that restrict movement of water; amount of water held available to plants; and need for drainage, or depth to water table or bedrock.

Terraces and diversions are embankments, or ridges, constructed across the slope to intercept runoff so that it soaks into the soil or flows slowly to a prepared outlet. Features that affect suitability of a soil for terraces are uniformity and steepness of slope;

TABLE 8.—*Estimated soil properties*

[An asterisk in the first column indicates that at least one mapping unit in this series is made up of two or more kinds of soil. The soils in such to other series that appear in the first column of this table. Absence of data indicates that the

Soil series and map symbols	Depth to—		Depth from surface	USDA texture	Classification	
	Seasonal high water table	Bedrock			Unified	AASHO
	Ft.	*Ft.*	*In.*			
Appling: ApB, ApC	>5	>5	0–8	Sandy loam	SM	A–2–4
			8–44	Clay	MH	A–7
			44–62	Sandy clay loam	SM, ML	A–5
*Ashe: ASG, ATG, AvF	>6	2½–10	0–7	Sandy loam	SM	A–2–4
For properties of Cleveland soils, see Cleveland series.			7–23	Sandy loam	SM	A–2–4
			23–35	Sandy loam	SM	A–2–4
*Brevard:						
BrC, BrD, BvE	>6	>10	0–7	Fine sandy loam	SM	A–2–4, A–4
For properties of Evard soil in BvE, see Evard series.			7–36	Sandy clay loam, clay loam.	SM, ML	A–4
			36–62	Sandy clay loam	SM	A–2, A–4
BsC2, BsE2	>6	>10	[1] 0–5	Sandy clay loam	SM, ML	A–2, A–4
Buncombe: BwB	>5	>10	0–8	Loamy sand	SM	A–2–4
			8–30	Loamy sand	SM	A–2–4
			30–65	Sand	SP, SP–SM	A–2–4, A–3
*Cartecay: Ca, Cb	½–1½	>10	0–19	Sandy loam	SM	A–2–4, A–4
For properties of Chewacla soil in Ca and for Toccoa soil in Cb, see their respective series.			19–28	Silt loam	SM, ML, MH	A–6, A–7
			28–46	Loamy sand	SM	A–2–4
			46–56	Fine sandy loam	SM	A–2–4
Cataula: CdB2, CdC2	>6	>5	0–7	Sandy loam	SM	A–2–4
			7–27	Clay	MH	A–7
			27–72	Sandy clay loam, clay loam.	ML, CL	A–5, A–7
Cecil:						
CeB, CeC, CeD	>6	>5	0–6	Sandy loam	SM	A–2–4
			6–9	Sandy clay loam	SM, ML	A–4
			9–47	Clay	MH	A–7
			47–58	Sandy clay loam	SM, ML	A–4, A–5
			58–70	Sandy loam	SM, ML	A–2–4, A–4, A–5
ClB2, ClC2	>6	>5	[1] 0–5	Clay loam	ML	A–4, A–5
Cecil-Urban land: CuC, CuE. Properties are variable, requires onsite investigation.						
Chewacla: Cv	1–2	>10	0–7	Silty clay loam	ML	A–4
			7–16	Silty clay loam	ML	A–4
			16–33	Clay loam	ML	A–6
			33–52	Fine sandy loam	SM, ML	A–5, A–6
Cleveland	>6	1–1½	0–5	Sandy loam	SM	A–2–4
Mapped only with Ashe soils.			5–14	Sandy loam	SM	A–2–4, A–4
Congaree: Cw	>5	>6	0–9	Fine sandy loam	SM, ML	A–4
			9–40	Sandy clay loam	ML	A–4, A–5
			40–75	Sandy clay loam	SM, ML	A–4, A–6
Durham: DuB	>5	>6	0–11	Loamy sand	SM	A–2–4
			11–47	Sandy clay loam, sandy clay.	SM, SC, CL	A–4, A–5
			47–56	Clay loam	SM, ML	A–4

See footnotes at end of table.

significant to engineering

mapping units may have different properties and limitations, and for this reason it is necessary to follow carefully the instructions for referring soil is too variable to be rated or that no estimate was made. The symbol > means greater than]

Percentage less than 3 inches passing sieve—				Permeability	Available water capacity	Reaction	Shrink-swell potential
No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)				
				In./hr.	*In./in. of soil*	*pH*	
95–100	90–95	51–75	15–35	2.0–6.0	0.10–0.14	4.5–6.0	Low.
100	95–100	75–85	60–75	0.6–2.0	0.12–0.18	4.5–5.5	Moderate.
100	95–100	60–80	40–55	0.6–2.0	0.14.0.18	4.5–5.5	Low.
90–95	80–90	65–75	15–20	2.0–6.0	0.06–0.10	4.5–5.5	Low.
92–96	85–92	65–75	20–25	2.0–6.0	0.06–0.12	4.5–5.5	Low.
90–95	80–90	65–75	15–20	2.0–6.0	0.06–0.10	4.5–5.5	Low.
98–100	95–99	65–75	20–45	2.0–6.0	0.11–0.17	5.1–6.0	Low.
95–100	92–100	60–85	36–55	0.6–2.0	0.12–0.17	5.1–6.0	Low.
95–100	98–100	60–85	30–50	0.6–2.0	0.12–0.18	5.1–6.0	Low.
95–100	92–100	60–85	30–50	0.6–2.0	0.12–0.17	5.1–6.0	Low.
95–98	90–96	65–75	15–25	6.0–20.0	0.04–0.08	5.1–6.0	Low.
95–98	92–97	65–75	15–25	6.0–20.0	0.04–0.08	5.1–6.0	Low.
95–98	90–95	65–75	3–12	6.0–20.0	0.02–0.05	5.1–6.0	Low.
98–100	95–100	50–75	20–45	2.0–6.0	0.10–0.14	5.1–6.0	Low.
100	95–100	90–95	40–65	2.0–6.0	0.15–0.20	5.1–6.0	Low.
98–100	95–100	50–75	15–25	2.0–6.0	0.08–0.12	5.1–6.0	Low.
98–100	95–100	50–85	15–35	2.0–6.0	0.08–0.12	5.1–6.0	Low.
98–100	95–100	50–80	20–35	2.0–6.0	0.10–0.14	5.1–6.0	Low.
98–100	95–100	75–85	55–75	0.06–0.2	0.10–0.15	4.5–5.5	Moderate.
98–100	95–100	65–85	55–65	0.2–0.6	0.12–0.18	4.5–5.5	Low.
98–100	95–100	60–80	20–30	2.0–6.0	0.10–0.14	4.5–6.5	Low.
100	98–100	60–80	40–60	0.6–2.0	0.12–0.18	4.5–5.5	Low.
100	100	80–90	65–80	0.6–2.0	0.12–0.18	4.5–5.5	Moderate.
100	100	75–85	40–60	0.6–2.0	0.12–0.18	4.5–5.5	Low.
100	95–100	60–85	30–60	0.6–2.0	0.10–0.14	4.5–5.5	Low.
98–100	95–100	60–80	55–65	0.6–2.0	0.12–0.18	4.5–6.5	Low.
100	100	85–98	70–90	0.6–2.0	0.13–0.15	5.1–6.0	Low.
100	100	85–98	85–95	0.6–2.0	0.14–0.18	5.1–6.0	Low.
100	100	90–95	70–80	0.6–2.0	0.15–0.20	5.1–6.0	Low.
100	100	95–100	45–55	0.6–2.0	0.12–0.18	5.1–6.0	Low.
75–95	60–90	50–75	20–35	2.0–6.0	0.08–0.12	4.5–6.0	Low.
75–95	65–90	55–80	20–40	2.0–6.0	0.08–0.12	4.5–6.0	Low.
100	100	90–100	45–65	2.0–6.0	0.11–0.15	5.1–6.5	Low.
100	98–100	90–100	55–75	0.6–2.0	0.12–0.17	5.1–6.5	Low.
100	98–100	90–100	45–55	2.0–6.0	0.12–0.17	5.1–6.5	Low.
98–100	95–100	65–75	20–35	0.6–2.0	0.06–0.10	4.5–5.5	Low.
100	98–100	75–85	45–55	0.6–2.0	0.12–0.15	4.5–5.5	Low.
100	98–100	75–85	40–60	0.6–2.0	0.12–0.15	4.5–5.5	Low.

TABLE 8.—*Estimated soil properties*

Soil series and map symbols	Depth to—		Depth from surface	USDA texture	Classification	
	Seasonal high water table	Bedrock			Unified	AASHO
	Ft.	*Ft.*	*In.*			
*Edneyville: EdC, EdD, EdE, EeF, EHG. For properties of Ashe soil in EHG, see Ashe series.	>6	>3½	0–7	Fine sandy loam	SM	A–2–4
			7–34	Sandy clay loam	SM, SC	A–4
			36–40	Sandy loam	SM	A–2–4
*Evard: EVF. For properties of Brevard soil, see Brevard series.	>6	>4	0–5	Sandy loam	SM, SC	A–2–4, A–4
			5–34	Sandy clay loam	SM, SC, CL	A–4, A–6
			34–55	Sandy loam	SM	A–2–4
Fannin: FaF	>6	>5	0–5	Fine sandy loam	SM	A–2–4, A–5
			5–24	Fine sandy clay loam	SM	A–2–4, A–4
			24–33	Fine sandy loam	SM	A–1–b, A–2–4, A–4
			33–48	Fine sandy loam	SM, SP, SM	A–2–4, A–4
Haywood: HaD	>6	>6	0–21	Loam	SM, ML	A–4
			21–43	Fine sandy loam	SM, ML	A–4
			43–49	Loamy fine sand	SM	A–2–4
Helena: HbB	>6	>3½	0–6	Sandy loam	SM	A–2, A–4
			6–16	Sandy clay loam, sandy clay.	SC, ML, MH	A–4, A–7
			16–42	Sandy clay, clay	MH	A–7
			42–48	Sandy clay loam	SM	A–2–4, A–4
Hiwassee: HeB, HeC, HeD, HeE	>10	>5	0–7	Sandy loam	SM	A–2–4, A–4
			7–62	Clay	MH, ML, CL	A–5, A–7
			62–82	Sandy clay loam	SM, MH, ML	A–2–5, A–5, A–7
HlB2, HlD2			[1] 0–5	Clay loam	ML	A–7
Louisburg: LuD, LuF	>6	2–6	0–8	Loamy sand	SM	A–2–4
			8–15	Sandy loam	SM	A–2–4, A–4
			15–27	Loamy sand	SM, SP–SM	A–2–4, A–3
Madison: McB, McC, McD, McE	>6	3–10	0–6	Sandy loam	SM	A–4, A–2–4
			6–42	Clay, clay loam	MH, ML	A–4, A–7
			42–60	Sandy loam	SM	A–4, A–2, A–5
MdC2, MdD2			[1] 0–4	Clay loam	ML	A–4
Pacolet: PcE, PcF	>6	>5	0–7	Sandy loam	SM	A–2–4, A–4
			7–22	Sandy clay, clay	ML, MH	A–7
			22–34	Sandy loam	SM	A–4, A–7
PdD2, PdE2, PfE3			[1] 0–3	Clay loam	ML	A–4
Porters: PrD, PrF, PrG	>6	2–6	0–12	Loam	ML	A–4
			12–42	Sandy clay loam	SM, ML	A–4, A–6
*Rock land-Cleveland: RoG. Too variable to rate; requires onsite investigation.						
*Saluda: SeE, SeF, SFG. For properties of Edneyville soil, see Edneyville series.	>6	3–10	0–6	Sandy loam	SM	A–2–4
			6–18	Sandy clay loam, sandy loam.	SM	A–2–4, A–4
			18–38	Loamy sand	SM	A–2–4
Talladega: TdG	>6	>2½	0–7	Loam	SM, GM	A–4
			7–28	Sandy clay loam	SM, GM	A–2–4, A–4
			28–32	Loamy sand	SM, GM	A–1–b

significant to engineering—Continued

Percentage less than 3 inches passing sieve—				Permeability	Available water capacity	Reaction	Shrink-swell potential
No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)				
				In./hr.	*In./in. of soil*	*pH*	
95–100	95–100	70–80	20–35	2.0–6.0	0.08–0.14	4.5–5.5	Low.
100	95–100	70–80	36–45	0.6–2.0	0.12–0.17	4.5–5.5	Low.
95–100	95–100	60–70	15–25	2.0–6.0	0.10–0.14	4.5–5.5	Low.
85–100	80–100	65–90	20–50	2.0–6.0	0.11–0.15	4.5–5.5	Low.
90–100	90–100	60–95	30–60	0.6–2.0	0.11–0.16	4.5–5.5	Low.
80–100	80–100	60–85	25–35	2.0–6.0	0.09–0.14	5.1–6.0	Low.
90–100	85–100	75–85	20–45	2.0–6.0	0.08–0.12	4.5–5.5	Low.
95–100	90–100	75–85	30–50	0.6–2.0	0.12–0.16	4.5–5.5	Low.
85–100	75–100	40–90	15–50	0.6–2.0	0.10–0.14	4.5–5.5	Low.
90–100	85–100	60–90	5–45	2.0–6.0	0.07–0.10	4.5–5.5	Low.
98–100	90–100	80–95	40–60	2.0–6.0	0.10–0.16	5.1–6.0	Low.
98–100	90–100	80–95	40–55	6.0–2.0	0.10–0.16	5.1–6.0	Low.
98–100	90–100	70–80	15–35	2.0–6.0	0.08–0.14	5.1–6.0	Low.
98–100	95–100	75–85	30–50	2.0–6.0	0.10–0.15	4.5–5.5	Low.
98–100	95–100	75–85	45–60	0.2–0.6	0.12–0.18	4.5–5.5	Low.
98–100	95–100	75–95	51–65	0.06–0.2	0.12–0.18	4.5–5.5	Moderate.
95–100	90–100	60–70	30–40	0.6–2.0	0.12–0.18	4.5–5.5	Low.
98–100	95–100	65–80	20–45	0.6–2.0	0.10–0.14	4.5–6.0	Low.
100	100	80–90	55–75	0.6–2.0	0.12–0.18	4.5–6.0	Moderate.
100	90–100	60–98	25–75	0.6–2.0	0.12–0.17	4.5–6.0	Low.
100	100	80–90	51–75	0.6–2.0	0.15–0.20	4.5–6.0	Low.
80–100	80–98	50–75	20–35	6.0–20.0	0.06–0.10	5.1–6.0	Low.
80–100	80–100	60–80	25–45	6.0–20.0	0.06–0.10	5.1–6.0	Low.
80–100	80–98	50–80	10–30	6.0–20.0	0.04–0.08	5.1–6.0	Low.
88–100	80–100	60–80	25–45	0.6–2.0	0.10–0.14	4.5–5.5	Low.
98–100	94–100	75–98	55–85	0.6–2.0	0.12–0.18	4.5–5.5	Moderate.
95–100	85–100	50–95	30–45	0.6–2.0	0.14–0.19	4.5–5.5	Low.
98–100	94–100	70–90	55–75	0.6–2.0	0.11–0.17	4.5–5.5	Low.
98–100	95–100	60–75	20–40	0.6–2.0	0.10–0.14	4.5–6.0	Low.
100	100	80–95	51–75	0.6–2.0	0.13–0.18	4.5–6.0	Moderate.
98–100	98–100	65–95	36–50	0.6–2.0	0.11–0.15	4.5–6.0	Low.
98–100	95–100	70–90	51–65	0.6–2.0	0.11–0.16	4.5–6.0	Low.
98–100	95–100	60–85	51–70	2.0–6.0	0.09–0.14	4.5–5.5	Low.
100	100	60–85	40–55	2.0–6.0	0.11–0.18	4.5–6.5	Low.
98–100	92–98	60–80	25–35	2.0–6.0	0.10–0.14	4.5–5.5	Low.
98–100	92–98	65–85	25–45	0.6–2.0	0.12–0.18	4.5–5.5	Low.
98–100	92–98	50–85	15–30	2.0–6.0	0.08–0.12	4.5–5.5	Low.
65–75	50–65	40–45	36–45	0.6–2.0	0.10–0.14	4.5–5.5	Low.
40–65	35–55	30–45	25–40	0.6–2.0	0.10–0.14	4.5–5.5	Low.
40–65	30–45	25–40	15–25	2.0–6.0	0.06–0.10	4.5–5.5	Low.

TABLE 8.—*Estimated soil properties*

Soil series and map symbols	Depth to—		Depth from surface	USDA texture	Classification	
	Seasonal high water table	Bedrock			Unified	AASHO
	Ft.	*Ft.*	*In.*			
Toccoa	>2½	>5	0–7	Sandy loam	SM	A–2–4, A–4
			7–42	Fine sandy loam, sandy loam.	SM	A–2–4, A–4
			42–52	Sandy loam, loamy sand.	SM	A–2–4
Mapped only with Cartecay soils.						
Urban land: Ur. Too variable to rate; requires onsite investigation.						
Wehadkee: Wd	0–1	>10	0–6	Silt loam	ML	A–4, A–6
			6–40	Loam, silty clay loam.	ML	A–6
			40–52	Sandy loam	SM	A–2–4
Wickham: WhB	>5	>6	0–9	Sandy loam	SM, ML	A–6
			9–48	Clay loam, sandy clay loam.	ML	A–6
			48–60	Sandy clay loam	SM, ML	A–6
			60–72	Sandy loam	SM, GM	A–2–4

[1] The soil below the surface layer is similar to that described for the other mappings units in the series.

depth to bedrock or other unfavorable material; presence of stones; permeability; and resistance to water erosion, soil slipping, and soil blowing. A soil suitable for these structures provides outlets for runoff and is not difficult to vegetate.

Grassed waterways are natural draws that are vegetated before receiving water from diversions and terraces. Features that affect suitability of soils for grassed waterways are the features that affect establishment, growth, and maintenance of plants and the layout and construction of the waterway. These include erodibility, soil texture, drainage, stoniness, slope, and available water capacity.

Use of the Soils for Town and Country Planning

In table 10 (page 60), the soils of Greenville County are rated according to limitations that affect their suitability as sites for light industries and for dwellings with community sewer systems; as septic tank absorption fields; and for sewage lagoons, local roads and streets, camp areas, picnic areas, playgrounds, and paths and trails.

The soils are rated as having slight, moderate, or severe limitations for the specified uses. For all of these ratings, it is assumed that a good cover of vegetation can be established and maintained. A limitation of *slight* means that soil properties are generally favorable and limitations are so minor that they easily can be overcome. A *moderate* limitation can be overcome or modified by planning, by design, or by special maintenance. A *severe* limitation means that costly soil reclamation, special design, intense maintenance, or a combination of these is required.

In table 10, sites for light industries and for dwellings with community sewer systems are rated for the undisturbed soils that are used to support building foundations. Emphasis is on foundations, ease of excavation for underground utilities, and corrosion potential of uncoated steel pipe. The undisturbed soil is rated for spread footing foundations for buildings less than three stories high or foundation loads not in excess of that weight. Properties affecting load-supporting capacity and settlement under load are wetness, flooding, texture, plasticity, density, and shrink-swell behavior. Properties affecting excavation are wetness, flooding, slope, and depth to bedrock. Properties affecting corrosion of buried uncoated steel pipe are wetness, texture, total acidity, and electrical resistivity.

Septic tank absorption fields are subsurface systems of tile or perforated pipe that distribute effluent from a septic tank into natural soil. The soil material from a depth of 18 inches to 6 feet is evaluated. The soil properties considered are those that affect both absorption of effluent and construction and operation of the system. Properties that affect absorption are permeability, depth to water table or rock, and susceptibility to flooding. Slope is a soil property that affects difficulty of layout and construction and also the risk of soil erosion, lateral seepage, and downslope flow of effluent. Large rocks or boulders increase construction costs.

Sewage lagoons are shallow ponds constructed to

significant to engineering—Continued

Percentage less than 3 inches passing sieve—				Permeability	Available water capacity	Reaction	Shrink-swell potential
No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)				
				In./hr.	*In./in. of soil*	*pH*	
95–100	92–98	80–90	25–45	2.0–6.0	0.10–0.14	5.6–6.5	Low.
95–100	92–98	60–70	20–50	2.0–6.0	0.10–0.14	5.6–6.5	Low.
95–100	92–98	60–70	20–35	2.0–6.0	0.08–0.14	5.1–6.0	Low.
100	98–100	75–85	55–70	0.6–2.0	0.12–0.18	5.6–6.5	Low.
100	98–100	75–85	55–85	0.6–2.0	0.16–0.20	5.6–6.5	Low.
98–100	95–98	65–80	25–35	0.6–2.0	0.10–0.14	5.6–6.5	Low.
90–95	85–95	70–80	45–55	0.6–2.0	0.12–0.18	5.1–6.0	Low.
95–100	90–98	80–90	51–75	0.6–2.0	0.12–0.18	4.5–6.0	Low.
90–95	85–90	75–85	40–60	0.6–2.0	0.12–0.18	4.5–6.0	Low.
65–95	55–90	40–90	25–35	2.0–6.0	0.10–0.14	4.5–6.0	Low.

hold sewage within a depth of 4 to 6 feet long enough for bacteria to decompose the solids. A lagoon has a nearly level floor, and its sides, or embankments, are of compacted soil material. The assumption is made that the embankment is compacted to medium density and the pond is protected from flooding. Properties are considered that affect the pond floor and the embankment. Those that affect the pond floor are permeability, organic matter, and slope, and if the floor needs to be leveled, depth to bedrock becomes important. The soil properties that affect the embankment are the engineering properties of the embankment material as interpreted from the Unified Soil Classification and the amounts of stones, if any, that influence the ease of excavation and compaction of the embankment material.

Local roads and streets, as rated in table 10, have an all-weather surface expected to carry automobile traffic all year. They have a subgrade of underlying soil material; a base consisting of gravel, crushed rock, or soil material stabilized with lime or cement; and a flexible or rigid surface, commonly asphalt or concrete. These roads are graded to shed water and have ordinary provisions for drainage. They are built mainly from soil at hand, and most cuts and fills are less than 6 feet deep.

Soil properties that most affect design and construction of roads and streets are the load-supporting capacity and stability of the subgrade and the workability and quantity of cut and fill material available. The AASHO and Unified classifications of the soil material, and also the shrink-swell potential, indicate traffic-supporting capacity. Wetness and flooding affect stability of the material. Slope, depth to hard rock, content of stones and rocks, and wetness affect ease of excavation and the amount of cut and fill needed to reach an even grade.

Camp areas are used intensively for tents and small camp trailers and the accompanying activities of outdoor living. Little preparation of the site is required, other than shaping and leveling for tent and parking areas. Camp areas are subject to heavy foot traffic and limited vehicular traffic. The best soils have mild slopes, good drainage, a surface free of rocks and coarse fragments, freedom from flooding during periods of heavy use, and a surface that is firm after rains but not dusty when dry.

Playgrounds are areas used intensively for baseball, football, badminton, and similar organized games. Soils suitable for this use need to withstand intensive foot traffic. The best soils have a nearly level surface free of coarse fragments and rock outcrops, good drainage, freedom from flooding during periods of heavy use, and a surface that is firm after rains but not dusty when dry. If grading and leveling are required, depth to rock is important.

Picnic areas are attractive natural or landscaped tracts used primarily for preparing meals and eating outdoors. These areas are subject to heavy foot traffic. Most of the vehicular traffic, however, is confined to access roads. The best soils are firm when wet but not dusty when dry; are free of flooding during the season of use; do not have slopes or stoniness that greatly

TABLE 9.—*Engineering*

[An asterisk in the first column indicates that at least one mapping unit in this series is made up of two or more kinds of soil. The soils in such to other series that appear in

Soil series and map symbols	Suitability as a source of—		Soil features affecting—	
	Topsoil	Road fill	Farm ponds	
			Reservoirs	Embankments
Appling: ApB, ApC	Fair: less than 16 inches of suitable material.	Fair: fair traffic-supporting capacity; moderate shrink-swell potential.	Moderate permeability.	Medium compressibility; moderate shrink-swell potential.
*Ashe: ASG, ATG, AvF For interpretations of Cleveland soil, see Cleveland series.	Poor: slope; coarse fragments.	Poor: slope; rockiness.	Moderately rapid permeability; slope.	Fair resistance to piping and erosion; limited borrow material.
*Brevard: BrC, BrD, BsC2, BsE2, BvE For interpretations of Evard soil in BvE, see Evard series.	Fair: less than 16 inches of suitable material; slope of 2 to 15 percent. Poor: slope of 25 to 40 percent.	Fair: fair traffic-supporting capacity; slope of 2 to 25 percent. Poor: slope of 25 to 40 percent.	Moderate permeability; slope.	Fair resistance to piping and erosion.
Buncombe: BwB	Poor: loamy sand surface layer.	Good	Rapid permeability	Poor resistance to piping; difficult to vegetate; rapid seepage rate.
*Cartecay: Ca, Cb For interpretations of Chewacla soil in Ca and for Toccoa soil in Cb, see their respective series.	Good	Fair: fair traffic-supporting capacity; high water table.	Moderately rapid permeability.	Poor resistance to piping; medium seepage.
Cataula: CdB2, CdC2	Poor: less than 8 inches of suitable material.	Poor: fair traffic-supporting capacity; moderate shrink-swell potential.	All features favorable.	Medium to low shear strength; moderate shrink-swell potential.
Cecil: CeB, CeC, CeD, ClB2, ClC2	Fair to poor: less than 16 inches of suitable material; slopes of 2 to 15 percent. Poor: slopes of 15 to 25 percent.	Fair: fair traffic-supporting capacity; moderate shrink-swell potential.	Moderate permeability; slope.	Medium compressibility; moderate shrink-swell potential.
*Cecil-Urban land: CuC, CuE. Too variable to rate; requires onsite investigation.				
Chewacla: Cv	Fair: silty clay loam surface layer.	Fair: fair traffic-supporting capacity; high water table.	All features favorable.	Poor resistance to piping; low shear strength; high moisture content.
Cleveland Mapped only with Ashe soils.	Poor: slope; coarse fragments.	Poor: slope; rockiness.	Moderately rapid permeability; slope.	Limited borrow material.
Congaree: Cw	Good	Fair: fair traffic-supporting capacity.	Moderate permeability.	Poor resistance to piping; low shear strength.
Durham: DuB	Fair: less than 16 inches of suitable material.	Fair: fair traffic-supporting capacity.	Moderate permeability.	Fair resistance to piping and erosion.

See footnote at end of table.

interpretations of the soils

mapping units may have different properties and limitations, and for this reason it is necessary to follow carefully the instructions for referring the first column of this table]

Soil features affecting—Continued			
Farm drainage	Sprinkler irrigation [1]	Terraces and diversions [1]	Grassed waterways [1]
Well drained	Moderate infiltration and permeability; medium available water capacity; slope.	Irregular slope; subject to erosion.	Irregular slope; subject to erosion.
Somewhat excessively drained	Steep slope	Steep slope; coarse fragments	Steep slope; coarse fragments; low productivity.
Well drained	Moderate infiltration and permeability; medium available water capacity; slope.	Steep slope	Steep slope.
Excessively drained	Rapid infiltration and permeability; low available water capacity.	Sandy	Low productivity.
Flood hazard; high water table	Moderate infiltration; moderately rapid permeability; medium available water capacity.	Nearly level	Nearly level; flood hazard; high water table.
Well drained	Moderate infiltration; slow permeability; medium available water capacity.	Irregular slope; subject to erosion.	Irregular slope; subject to erosion.
Well drained	Moderate infiltration and permeability; medium available water capacity; slope.	Irregular slope; subject to erosion.	Irregular slope; subject to erosion.
Flood hazard; high water table	Moderate infiltration and permeability; high available water capacity.	Nearly level	Nearly level; flood hazard; high water table.
Somewhat excessively drained	Steep slope	Steep slope; coarse fragments	Steepness of slope; coarse fragments.
Flood hazard	Moderated infiltration and permeability; medium available water capacity.	Nearly level	Nearly level; flood hazard.
Well drained	Rapid infiltration; moderate permeability; medium available water capacity.	Irregular slope; subject to erosion.	Irregular slope; subject to erosion.

TABLE 9.—*Engineering interpretations*

Soil series and map symbols	Suitability as a source of—		Soil features affecting—	
	Topsoil	Road fill	Farm ponds	
			Reservoirs	Embankments
*Edneyville: EdC, EdD, EdE, EeF, EHG. For interpretations of Ashe soil in EHG, see Ashe series.	Fair: less than 16 inches of suitable material; slope of 6 to 15 percent. Poor: slope of 15 to 70 percent.	Fair: fair traffic-supporting capacity; rockiness; slope of 6 to 25 percent. Poor: slope of 25 to 70 percent.	Moderate permeability; slope.	Fair resistance to piping and erosion.
*Evard: EVF. For interpretations of Brevard soil in EVF, see Brevard series.	Poor: less than 8 inches of suitable material; slope.	Poor: slope.	Moderate permeability; slope.	Fair resistance to piping.
Fannin: FaF.	Poor: slope.	Poor: high in mica content; slope.	Moderate permeability; slope.	Moderate compressibility; micaceous.
Haywood: HaD.	Fair: slope.	Good.	Rapid permeability; slope.	Fair resistance to piping and erosion.
Helena: HbB.	Fair: less than 16 inches of suitable material.	Poor: poor traffic-supporting capacity; moderate shrink-swell potential.	All features favorable.	Moderate shrink-swell potential: moderate compressibility.
Hiwassee: HeB, HeC, HeD, HeE, HlB2, HlD2.	Fair: less than 16 inches of suitable material; slope of 2 to 15 percent. Poor: slope of 15 to 25 percent.	Fair: fair traffic-supporting capacity; moderate shrink-swell potential.	Moderate permeability; slope.	Moderate shrink-swell potential; moderate compressibility.
Louisburg: LuD, LuF.	Poor: loamy sand surface layer; coarse fragments.	Fair: coarse fragments; slope of 6 to 25 percent. Poor: slope of 25 to 40 percent.	Rapid permeability; slope.	Fair resistance to piping; limited borrow material; vegetation difficult to establish.
Madison: McB, McC, McD, McE, MdC2, MdD2.	Fair: less than 16 inches of suitable material; slope of 2 to 15 percent. Poor: slope of 15 to 25 percent.	Poor: poor traffic-supporting capacity; micaceous; moderate shrink-swell potential.	Moderate permeability; slope.	Micaceous; poor stability; high compressibility; moderate shrink-swell potential.
Pacolet: PcE, PcF, PdD2, PdE2.	Poor: slope.	Poor: poor traffic-supporting capacity; moderate shrink-swell potential.	Moderate permeability; slope.	High compressibility; fair slope stability; moderate shrink-swell potential.
PfE3. Too variable to rate; requires onsite investigation.				
Porters: PrD, PrF, PrG.	Fair: less than 16 inches of suitable material; slope of 6 to 15 percent. Poor: slope of 15 to 70 percent.	Fair: fair traffic-supporting capacity; rockiness; slope of 6 to 25 percent. Poor: slope of 25 to 70 percent.	Moderately rapid permeability; slope.	Fair resistance to piping and erosion; fair slope stability; limited borrow material.
*Rockland-Cleveland: RoG. Too variable to rate; requires onsite investigation.				

See footnote at end of table.

of the soils—Continued

Soil features affecting—Continued			
Farm drainage	Sprinkler irrigation [1]	Terraces and diversions [1]	Grassed waterways [1]
Well drained	Moderate infiltration and moderate permeability; medium available water capacity; slope.	Steep slope	Steep slope.
Well drained	Steep slope	Steep slope	Steep slope.
Well drained	Steep slope	Steep slope	Steepness of slope.
Well drained	Moderate infiltration; rapid permeability; medium available water capacity; slope.	Irregular slope	Irregular slope.
Moderately well drained	Moderate infiltration; slow permeability; medium available water capacity.	Irregular slope; subject to erosion.	Irregular slope.
Well drained	Moderate infiltration and permeability; medium available water capacity; slope.	Irregular slope; subject to erosion.	Irregular slope; subject to erosion.
Well drained	Rapid infiltration and permeability; low available water capacity; slope.	Shallow to rock; low productivity; steepness of slope.	Shallow to rock; low productivity; steepness of slope.
Well drained	Moderate infiltration and permeability; medium available water capacity; slope.	Irregular slope; subject to erosion.	Irregular slope; subject to erosion.
Well drained	Steep slope	Steepness of slope	Steepness of slope.
Well drained	Moderate infiltration; moderately rapid permeability; medium available water capacity; slope.	Irregular slope; steepness of slope.	Irregular slope; steepness of slope.

TABLE 9.—*Engineering interpretations*

Soil series and map symbols	Suitability as a source of—		Soil features affecting—	
	Topsoil	Road fill	Farm ponds	
			Reservoirs	Embankments
*Saluda: SeE, SeF, SFG For interpretations of Edneyville soil, see Edneyville series.	Poor: slope	Fair: rockiness; slope of 15 to 25 percent. Poor: slope of 25 to 80 percent.	Moderate permeability; slope.	Fair resistance to piping; limited borrow material.
Talladega: TdG	Poor: coarse fragments; slope.	Poor: rockiness; slope.	Moderate permeability; slope.	Poor resistance to piping and erosion; limited borrow material.
Toccoa Mapped only with Cartecay soils.	Good	Good	Moderately rapid permeability.	Poor resistance to piping.
Urban land: Ur. Too variable to rate; requires onsite investigation.				
Wehadkee: Wd	Poor: poorly drained.	Poor: poorly drained.	Moderate permeability.	Fair resistance to piping; fair to poor stability; high moisture content.
Wickham: WhB	Fair: less than 16 inches of suitable material.	Fair: fair traffic-supporting capacity.	Moderate permeability.	Fair resistance to piping; poor stability; moderate compressibility.

[1] Practice generally not applied on areas where the slope is more than 10 percent.

increases cost of leveling sites or of building access roads.

Paths and trails are used for local and cross country travel by foot or horseback. Design and layout should require little or no cutting and filling. The best soils are at least moderately well drained, are firm when wet but not dusty when dry, are flooded not more than once during the season of use, have slopes of less than 15 percent, and have few or no rocks or stones on the surface.

Formation, Morphology, and Classification of the Soils

This section has three main parts. The first part tells how the soils of Greenville County formed and discusses the principal factors that control soil formation. The second part tells about the form and structure of soils. The third part tells how the soils are classified and discusses Soil Taxonomy of the National Cooperative Soil Survey. The third part also contains a table that shows how the soil series are classified into families, subgroups, and orders.

Formation of Soils

The environmental factors responsible for the formation of soils are parent material, relief, climate, living organisms (plants and animals), and time. These factors are discussed and some of their relationships to the kinds of soil in Greenville County are explained in the following paragraphs.

Parent material

The two broad classes of parent material in Greenville County are residual material and transported material. Residual material has weathered in place from the underlying bedrock. Soils that formed in residual material have morphological, chemical, and textural characteristics related to the rocks. The transported material—alluvium and colluvium—was carried by water or was moved by gravity and laid down as unconsolidated deposits of clay, silt, sand, gravel, and fragments of rock. Characteristics of the transported material are related to the characteristics of the soils or rocks from which the material has washed or otherwise been deposited.

The rocks of Greenville County are mostly granite, gneiss, and schist. The granite rocks contain quartz,

of the soils—Continued

Soil features affecting—Continued			
Farm drainage	Sprinkler irrigation [1]	Terraces and diversions [1]	Grassed waterways [1]
Well drained	Steep slope	Steep slope; shallow soil	Steepness of slope; shallow soil.
Well drained	Steep slope	Steep slope	Steepness of slope.
Flood hazard; seasonal high water table.	Moderate infiltration; moderately rapid permeability; medium available water capacity.	Nearly level	Flood hazard; seasonal high water table.
Flood hazard; high water table	Moderate infiltration and permeability; high available water capacity.	Nearly level	Flood hazard; high water table.
Well drained	Moderate infiltration and permeability; medium available water capacity.	Irregular slope; subject to erosion.	Irregular slope; subject to erosion.

which is hard and weathers slowly. The gneiss rocks are not so hard or so dense, and they weather more readily than the granite rocks. Appling, Ashe, Cataula, Cecil, Cleveland, Durham, Edneyville, Evard, Helena, Hiwassee, Louisburg, Pacolet, and Porters soils are the dominant soils that formed in material weathered from granite and gneiss rock. The schist rocks are micaceous, relatively soft, and deeply weathered. Appling, Cecil, Fannin, Hiwassee, Madison, Pacolet, and Talladega soils are the dominant soils that formed in material weathered from schist rocks. Many soils in Greenville County formed in material weathered from either or all of these rocks. Such steep and very steep soils as the Cleveland, Saluda, and Talladega are shallow and weakly developed.

Soils that formed in transported alluvial material on first bottoms are weakly developed and still receive deposits during floods. Recent deposits along drainageways and streams show little development. The Buncombe, Cartecay, Chewacla, Congaree, Toccoa, and Wehadkee soils are the dominant soils that formed in alluvium on bottom lands. The Wickham soils formed in older alluvium on high stream terraces. Soils that formed in alluvium and colluvium are the Brevard and Haywood soils.

Climate

About three-fourths of Greenville County has an elevation of about 700 to 1,200 feet above sea level. Annual rainfall is 47 to 51 inches. The other one-fourth lies above an elevation of 1,200 feet and is somewhat colder. At this higher elevation, annual rainfall is about 75 inches. Temperature and precipitation are discussed in more detail in the section on climate in "Additional Facts About the County." The county is a transitional area in which both thermic and mesic soils occur. (Sss discussion of families under "Classification of Soils.")

Climate affects the physical, chemical, and biological relationships in the soil through the influence of precipitation and temperature. Water dissolves minerals, supports chemical and biological activity, and transports mineral and organic residues through the soil.

The amount of water that percolates through the soil is dependent upon rainfall, humidity, frost-free period, infiltration, physiographic position, slope, and soil permeability. Rainwater promotes the leaching of

TABLE 10.—*Degree and kind of limitations*

[An asterisk in the first column indicates that at least one mapping unit in this series is made up of two or more kinds of soil. The soils in such to other series that appear in

Soil series and map symbols	Sites for light industries and for dwellings with community sewer systems	Septic tank absorption fields	Sewage lagoons	Local roads and streets
Appling: ApB, ApC	Moderate: moderate shrink-swell potential.	Moderate: moderate permeability.	Moderate where slope is 2 to 6 percent: moderate permeability. Severe where slope is 6 to 10 percent.	Moderate: fair traffic-supporting capacity; moderate shrink-swell potential.
*Ashe: ASG, ATG, AvF. For Cleveland part, see Cleveland series.	Severe: rock at a depth of 2½ to 10 feet; slope.	Severe: rock at a depth of 2½ to 10 feet; slope.	Severe: moderately rapid permeability; rock at a depth of 2½ to 10 feet; slope.	Severe: rock at a depth of 2½ to 10 feet; slope.
*Brevard: BrC, BrD, BsC2, BsE2, BvE. For properties of Evard soil in BvE, see Evard series.	Slight where slope is 2 to 10 percent. Moderate where slope is 10 to 15 percent. Severe where slope is 15 to 40 percent.	Slight where slope is 2 to 6 percent. Moderate where slope is 6 to 15 percent. Severe where slope is 15 to 40 percent.	Moderate where slope is 2 to 6 percent: moderate permeability. Severe where slope is 6 to 40 percent.	Moderate where slope is 2 to 15 percent: fair traffic-supporting capacity. Severe where slope is 15 to 40 percent.
Buncombe: BwB	Severe: flood hazard	Severe: flood hazard	Severe: rapid permeability; flood hazard.	Severe: flood hazard
*Cartecay: Ca, Cb. For properties of Chewacla soil in Ca and for Toccoa soil in Cb, see their respective series.	Severe: high water table; flood hazard.	Severe: high water table; flood hazard.	Severe: high water table; moderately rapid permeability.	Severe: flood hazard
Cataula: CdB2, CdC2	Moderate: moderate shrink-swell potential; fair bearing strength.	Severe: slow permeability.	Moderate where slope is 2 to 6 percent. Severe where slope is 6 to 10 percent.	Severe: poor traffic-supporting capacity; moderate shrink-swell potential.
Cecil: CeB, CeC, CeD, ClB2, ClC2	Moderate where slope is 2 to 15 percent: moderate shrink-swell potential; fair bearing strength. Severe where slope is 15 to 25 percent.	Moderate where slope is 6 to 15 percent: moderate permeability. Severe where slope is 15 to 25 percent.	Moderate where slope is 2 to 6 percent: moderate permeability. Severe where slope is 6 to 25 percent.	Moderate where slope is 2 to 15 percent: fair traffic-supporting capacity; moderate shrink-swell potential. Severe where slope is 15 to 25 percent.
*Cecil-Urban land: CuC, CuE. Too variable to rate; requires onsite investigation.				
Chewacla: Cv	Severe: flood hazard; high water table; low bearing strength.	Severe: high water table; flood hazard.	Moderate: poor stability; high water table; moderate permeability.	Severe: poor traffic-supporting capacity; flood hazard.
Cleveland. Mapped only with Ashe soils.	Severe: slope; rock at a depth of 1½ feet.	Severe: slope; rock at a depth of 1½ feet.	Severe: slope; moderately rapid permeability; rock at a depth of 1½ feet.	Severe: slope; rock at a depth of 1½ feet.
Congaree: Cw	Severe: flood hazard	Severe: flood hazard	Severe: moderate permeability.	Severe: flood hazard
Durham: DuB	Slight	Moderate: moderate permeability.	Moderate: slope; moderate permeability.	Moderate: fair traffic-supporting capacity.

of soils for town and country planning

mapping units may have different properties and limitations, and for this reason it is necessary to follow carefully the instructions for referring the first column of this table]

Recreational sites			
Camp areas	Picnic areas	Playgrounds	Paths and trails
Slight where slope is 2 to 6 percent. Moderate where slope is 6 to 10 percent.	Slight	Moderate where slope is 2 to 6 percent. Severe where slope is 6 to 10 percent.	Slight.
Severe: slope	Severe: slope	Severe: slope	Moderate where slope is 15 to 25 percent. Severe where slope is 25 to 75 percent.
Slight where slope is 2 to 6 percent. Moderate where slope is 6 to 15 percent. Severe where slope is 15 to 40 percent.	Slight where slope is 2 to 10 percent. Moderate where slope is 10 to 15 percent. Severe where slope is 15 to 40 percent.	Moderate where slope is 2 to 6 percent. Severe where slope is 6 to 40 percent.	Slight where slope is 2 to 15 percent. Moderate where slope is 15 to 25 percent. Severe where slope is 25 to 40 percent.
Severe: flood hazard	Moderate: flood hazard; sandy surface layer.	Severe: flood hazard; sandy surface layer.	Moderate: sandy surface layer; flood hazard.
Severe: high water table; flood hazard.	Moderate: flood hazard; high water table.	Severe: flood hazard; high water table.	Moderate: high water table; flood hazard.
Moderate: slow permeability	Slight	Moderate slow permeability. slope is 2 to 6 percent. Severe where slope is 6 to 10 percent.	Slight.
Slight where slope is 2 to 6 percent. Moderate where slope is 6 to 15 percent. Severe where slope is 15 to 25 percent.	Slight where slope is 2 to 10 percent. Moderate where slope is 10 to 15 percent. Severe where slope is 15 to 25 percent.	Moderate where slope is 2 to 6 percent. Severe where slope is 6 to 25 percent.	Slight where slope is 2 to 10 percent. Moderate where slope is 10 to 25 percent.
Severe: somewhat poorly drained; flood hazard.	Moderate: somewhat poorly drained; flood hazard.	Severe: somewhat poorly drained; flood hazard.	Moderate: somewhat poorly drained; flood hazard.
Severe: slope; rock	Severe: slope; rock	Severe: slope; rock	Moderate where slope is 15 to 25 percent. Severe where slope is 25 to 90 percent; rock.
Severe: flood hazard	Moderate: flood hazard	Severe: flood hazard	Moderate: flood hazard.
Slight	Slight	Moderate: slope	Slight.

TABLE 10.—*Degree and kind of limitations of soils*

Soil series and map symbols	Sites for light industries and for dwellings with community sewer systems	Septic tank absorption fields	Sewage lagoons	Local roads and streets
*Edneyville: EdC, EdD, EeF, EHG—For properties of Ashe soil in EHG, see Ashe series.	Slight where slope is 6 to 10 percent. Moderate where slope is 10 to 15 percent. Severe where slope is 15 to 70 percent.	Moderate where slope is 6 to 15 percent. Severe where slope is 15 to 70 percent.	Severe: moderate permeability; slope.	Moderate where slope is 6 to 15 percent. Severe where slope is 15 to 70 percent.
*Evard: EVF—For properties of Brevard soil in EVF, see Brevard series.	Severe: slope; rock at a depth of 4 feet.	Severe: slope; rock at a depth of 4 feet.	Severe: slope; rock at a depth of 4 feet.	Severe: slope; rock at a depth of 4 feet.
Fannin: FaF	Severe: slope	Severe: slope	Severe: slope	Severe: slope
Haywood: HaD	Slight where slope is 6 to 10 percent. Moderate where slope is 10 to 15 percent.	Slight where slope is 6 to 10 percent. Moderate where slope is 10 to 15 percent.	Severe: slope	Moderate: slope
Helena: HbB	Moderate: fair bearing strength; moderate shrink-swell potential.	Severe: slow permeability.	Moderate: slope is 2 to 6 percent.	Severe: poor traffic-supporting capacity; moderate shrink-swell potential.
Hiwassee: HeB, HeC, HeD, HeE, HlB2, HlD2.	Moderate where slope is 2 to 15 percent: fair bearing strength. Severe where slope is 15 to 25 percent.	Moderate where slope is 2 to 15 percent: moderate permeability. Severe where slope is 15 to 25 percent.	Moderate where slope is 2 to 6 percent: moderate permeability. Severe where slope is 6 to 25 percent.	Moderate where slope is 2 to 15 percent: fair traffic-supporting capacity; moderate shrink-swell potential. Severe where slope is 15 to 25 percent.
Louisburg: LuD, LuF	Moderate where slope is 6 to 15 percent: rock. Severe where slope is 15 to 40 percent: rock.	Moderate where slope is 6 to 15 percent: rock. Severe where slope is 15 to 40 percent: rock.	Severe: rapid permeability; slope; rock.	Moderate where slope is 6 to 15 percent: rock. Severe where slope is 15 to 40 percent.
Madison: McB, McC, McD, McE, MdC2, MdD2.	Moderate where slope is 2 to 15 percent: fair bearing strength. Severe where slope is 15 to 25 percent.	Moderate where slope is 2 to 15 percent: moderate permeability. Severe where slope is 15 to 25 percent.	Moderate where slope is 2 to 6 percent: moderate permeability. Severe where slope is 6 to 15 percent.	Severe: poor traffic-supporting capacity; moderate shrink-swell potential.
Pacolet: PcE, PcF, PdD2, PdE2	Moderate where slope is 10 to 15 percent: fair bearing strength. Severe where slope is 15 to 40 percent.	Moderate where slope is 10 to 15 percent: moderate permeability. Severe where slope is 15 to 40 percent.	Severe: slope	Moderate where slope is 10 to 15 percent: fair traffic-supporting capacity; moderate shrink-swell potential. Severe where slope is 15 to 40 percent.
PfE3.	Too variable to rate; requires onsite investigation.			
Porters: PrD, PrF, PrG	Slight where slope is 6 to 10 percent. Moderate where slope is 10 to 15 percent. Severe where slope is 15 to 70 percent.	Moderate where slope is 6 to 15 percent. Severe where slope is 15 to 70 percent.	Severe: moderately rapid permeability; slope.	Moderate where slope is 6 to 15 percent. Severe where slope is 15 to 70 percent.

for town and country planning—Continued

Recreational sites			
Camp areas	Picnic areas	Playgrounds	Paths and trails
Moderate where slope is 6 to 15 percent. Severe where slope is 15 to 70 percent.	Slight where slope is 6 to 10 percent. Moderate where slope is 10 to 15 percent. Severe where slope is 15 to 70 percent.	Severe: slope	Slight where slope is 6 to 15 percent. Moderate where slope is 15 to 25 percent. Severe where slope is 25 to 70 percent.
Severe: slope; rock	Severe: slope; rock	Severe: slope; rock	Moderate where slope is 15 to 25 percent rock. Severe where slope is 25 to 40 percent.
Severe: slope	Severe: slope	Severe: slope	Moderate where slope is 15 to 25 percent. Severe where slope is 25 to 40 percent.
Moderate: slope	Slight where slope is 6 to 10 percent. Moderate where slope is 10 to 15 percent.	Severe: slope	Slight.
Moderate: slow permeability	Slight	Moderate: slow permeability	Slight.
Slight where slope is 2 to 6 percent. Moderate where slope is 6 to 15 percent. Severe where slope is 15 to 25 percent.	Slight where slope is 2 to 10 percent. Moderate where slope is 10 to 15 percent. Severe where slope is 15 to 25 percent.	Moderate where slope is 2 to 6 percent. Severe where slope is 6 to 25 percent.	Slight where slope is 2 to 15 percent. Moderate where slope is 15 to 25 percent.
Moderate where slope is 6 to 15 percent: rockiness. Severe where slope is 15 to 40 percent: rockiness.	Moderate where slope is 6 to 15 percent: rockiness. Severe where slope is 15 to 40 percent.	Severe: slope; rock	Moderate where slope is 6 to 25 percent: rockiness. Severe where slope is 25 to 40 percent.
Slight where slope is 2 to 6 percent. Moderate where slope is 6 to 15 percent. Severe where slope is 15 to 25 percent.	Slight where slope is 2 to 10 percent. Moderate where slope is 10 to 15 percent. Severe where slope is 15 to 25 percent.	Moderate where slope is 2 to 6 percent. Severe where slope is 6 to 25 percent.	Slight where slope is 2 to 15 percent. Moderate where slope is 15 to 25 percent.
Moderate where slope is 10 to 15 percent. Severe where slope is 15 to 40 percent.	Moderate where slope is 10 to 15 percent. Severe where slope is 15 to 40 percent.	Severe: slope	Slight where slope is 10 to 15 percent. Moderate where slope is 15 to 25 percent. Severe where slope is 25 to 40 percent.
Moderate where slope is 6 to 15 percent. Severe where slope is 15 to 70 percent.	Slight where slope is 6 to 10 percent. Moderate where slope is 10 to 15 percent. Severe where slope is 15 to 70 percent.	Severe: slope	Slight where slope is 6 to 15 percent. Moderate where slope is 15 to 25 percent. Severe where slope is 25 to 70 percent.

TABLE 10.—*Degree and kind of limitations of soils*

Soil series and map symbols	Sites for light industries and for dwellings with community sewer systems	Septic tank absorption fields	Sewage lagoons	Local roads and streets
*Rock land-Cleveland: RoG. Too variable to rate; requires onsite investigation.				
*Saluda: SeE, SeF, SFG. For properties of Edneyville soil, see Edneyville series.	Severe: slope; rock at a depth of 3 to 10 feet.	Severe: slope; rock at a depth of 3 to 10 feet.	Severe: slope; rock at a depth of 3 to 10 feet.	Severe: slope.
Talladega: TdG	Severe: slope; rock at a depth of 2½ feet.	Severe: slope; rock at a depth of 2½ feet.	Severe: slope; rock at a depth of 2½ feet.	Severe: slope; rock at a depth of 2½ feet.
Toccoa. Mapped only with Cartecay soils.	Severe: high water table; flood hazard.	Severe: high water table; flood hazard.	Severe: moderately rapid permeability.	Severe: flood hazard.
Urban land: Ur. Too variable to rate; requires onsite investigation.				
Wehadkee: Wd	Severe: high water table; flood hazard.	Severe: high water table; flood hazard.	Severe: high water table.	Severe: poor traffic-supporting capacity; flood hazard.
Wickham: WhB	Slight	Slight	Moderate: moderate permeability.	Slight

soluble bases and the translocation of less soluble and colloidal material downward through the soil.

Temperature influences the kinds and growth of living organisms and the speed of physical and chemical reactions in the soils.

In Greenville County, most of the soils are highly leached, acid, and low in fertility, and they have well-developed horizons. Climate has not had time to affect the young soils that formed in alluvium or colluvium or the steep and very steep soils that erode almost as fast as they form.

Relief

Relief affects the formation of soils by influencing internal drainage, runoff, geologic erosion, temperature, and plant cover. It can alter the effects of parent material on the development of soils to the extent that several different kinds of soils may form from the same kind of parent material.

In this county, relief ranges from nearly level to very steep. Most soils on uplands, that have slopes of less than 15 percent, have a thick, well-developed profile. Appling and Cecil soils are examples. Where the relief is steep or very steep, the soil material is removed by geologic erosion almost as fast as it forms, causing the formation of such excessively drained, shallow soils as the Cleveland and Talladega. In nearly level areas, where the soil material is too wet for good aeration and organic material accumulates, the soils that form are poorly drained. Wehadkee soils formed in this environment.

Time

Time is an important factor in the alteration of parent material necessary for the development of distinct genetic horizons in the soil profile. In soil genesis, time refers to the degree of development of the soil profile, rather than to the actual length of time the soil has undergone the processes that lead to the development of a profile. Soils are considered either mature or immature. Mature soils, such as the Cecil soils, have well-defined genetic horizons and are said to be in equilibrium with their environment. Immature soils, such as the Toccoa soils, show little or no development of genetic horizons.

Although time determines the degree of maturity of a soil to a great extent, other factors that greatly influence maturity are relief, the kind of parent material, climate, and plant and animal life. Steep or very steep Cleveland soils show little or no development of a subsoil and are said to be immature because geologic erosion has removed soil material as fast as it has accumulated. On the flood plains, soils such as the Cartecay, for example, are immature because soil materials are constantly being added after floods, and since the soils have been in place only a short time, the soil-forming processes do not alter them.

Living organisms

In Greenville County, trees, shrubs, grasses, microorganisms, and other forms of plant and animal life are agents in the formation of soils. Parent material, climate, relief, and time, are factors that determine

for town and country planning—Continued

Recreational sites			
Camp areas	Picnic areas	Playgrounds	Paths and trails
Severe: slope; rockiness	Severe: slope; rockiness	Severe: slope; rockiness	Moderate where slope is 15 to 25 percent. Severe where slope is 25 to 80 percent.
Severe: slope; rock	Severe: slope; rock	Severe: slope; rock	Severe: slope; rock.
Severe: flood hazard	Moderate: flood hazard	Severe: flood hazard	Moderate: flood hazard.
Severe: poorly drained; flood hazard.	Severe: poorly drained; flood hazard.	Severe: poorly drained; flood hazard.	Severe: poorly drained; flood hazard.
Slight	Slight	Moderate: slope	Slight.

the kind of plants and animals that live on and in the soil.

Plants supply organic matter, and they transfer moisture and plant nutrients from the lower soil horizons to the upper soil horizons. Organic matter decomposes and is mixed into the soil by the action of micro-organisms and worms or by chemical reaction. The rate in which organic matter decomposes is influenced by temperature, moisture, favorable population of bacteria, fungi, other micro-organisms, and condition of the organic matter. In this county, organic matter has not accumulated to any great extent.

With the development of agriculture, man has become a soil-forming factor. Man affects soil formation by clearing the forest and cultivating the land. He changes the soil by mixing the upper horizons, by cultivating the slopes and thus causing erosion, and by adding lime and fertilizer.

Bacteria, fungi, and other micro-organisms hasten the weathering of rock and the decomposition of organic matter. They assimilate and transform chemicals in the soil. Most of the bacteria, fungi, and other micro-organisms in the soils of Greenville County are in the upper few inches.

Morphology of Soils

If a vertical cut is dug into a soil, several layers or horizons are evident. The differentiation of horizons is the result of many soil-forming processes. These include the accumulation of organic matter; the leaching of soluble salts; reduction and translocation of iron; the formation of soil structure; such physical weathering as freezing and thawing; and chemical weathering of primary minerals or rocks.

Some of these processes are continually taking place in all soils, but the number of active processes and the degree of their activity vary from one soil to another.

Most soils contain three major horizons, called A, B, and C. These major horizons are further subdivided by the use of subscripts and letters to indicate changes within one horizon. An example is the B2t horizon, which is a layer within the B horizon that has translocated clay illuviated from the A horizon.

The A horizon is the surface layer. The layer with the largest accumulation of organic matter is called an A1 horizon. If the soils are cleared and plowed, the surface layer is called an Ap horizon. The Haywood soils are examples of soils that have a distinctive, dark-colored A1 horizon, and the Congaree soils have a distinctive, dark-colored Ap horizon. The A horizon is the layer of maximum leaching or eluviation of clay and iron. Where considerable leaching has taken place, an A2 horizon is formed just below the surface layer. Normally, it is the lightest colored horizon in the soil. It is expressed in the Brevard soils.

The B horizon lies underneath the A horizon and is called the subsoil. It is the horizon of accumulation, or illuviation of clay, iron, aluminum, or other compounds leached from the A horizon. The Cecil and Hiwassee are among the soils that have a well-expressed B horizon.

The C horizon is below the A or B horizon. Some

soils, such as the Buncombe and Congaree, have not formed a B horizon; and in these the C horizon lies immediately under the A horizon. The C horizon consists of materials that are little altered by the soil-forming processes but are modified by weathering.

Cataula soils have a fragipan horizon that generally is below the B horizon, or 20 to 36 inches below the surface. This horizon is very low in organic-matter content. It appears cemented and is very hard when dry. When moist the fragipan layer is brittle. This layer is horizontally mottled or streaked, is slowly or very slowly permeable to water, and generally has few or many bleached fracture planes that form polygons.

Well-drained soils in Greenville County have yellowish-brown, brownish-yellow, or reddish subsoil horizons. These colors are mainly caused by thin coatings of iron oxide on the sand, silt, and clay particles. A soil is considered well drained if it is free of gray (chroma 2 or less) mottles to a depth of at least 30 inches. Cecil, Edneyville, and Madison are among the well-drained soils in Greenville County.

Moderately well drained soils are wet for short periods of time and generally are free of gray (chroma 2 or less) mottles to a depth of about 15 to 20 inches. Helena soils are representative of moderately well drained soils. Somewhat poorly drained soils have gray mottles near the A horizon. Cartecay soils are representative of the somewhat poorly drained soils.

The reduction and transfer of iron is associated with the wetter, more poorly drained soils. This process is called gleying. Such poorly drained soils as the Wehadkee have a subsoil and underlying materials that are grayish, and this indicates that reduction and transfer of iron has taken place.

Classification of the Soils

Soils are classified so that we can more easily remember their significant characteristics. Classification enables us to assemble knowledge about the soils, to see their relationship to one another and to the whole environment, and to develop principles that help us to understand their behavior and their response to manipulation. First through classification, and then through use of soil maps, we can apply our knowledge of soils to specific fields and other tracts of land.

The narrow categories of classification, such as those used in detailed soil surveys, allow us to organize and apply knowledge about soils in managing farms, fields, and woodlands; in developing rural areas; in engineering work; and in many other ways. Soils are placed in broad classes to facilitate study and comparison in large areas such as countries and continents.

The system of soil classification currently used was adopted by the National Cooperative Soil Survey in 1965. Because this system is under continual study, readers interested in developments of the current system should search the latest literature available (*8*).

The current system of classification has six categories. Beginning with the most inclusive, these categories are the order, suborder, great group, subgroup, family, and series. In this system, the criteria used as a basis for classification are soil properties that are observable and measurable. The properties are chosen, however, so that the soils of similar genesis, or mode of origin, are grouped. In table 11, the soil series of Greenville County are placed in three categories of the current system. Classes of the current system are briefly defined in the following paragraphs.

ORDER. Ten soil orders are recognized. The properties used to differentiate among soil orders are those that tend to give broad climatic groupings of soils. The two exceptions to this, the Entisols and Histosols, occur in many different climates. Each order is named with a word of three or four syllables ending in *sol* (Ent-i-sol).

SUBORDER. Each order is subdivided into suborders that are based primarily on those soil characteristics that seem to produce classes with the greatest genetic similarity. The suborders narrow the broad climatic range permitted in the order. The soil properties used to separate suborders are mainly those that reflect either the presence or absence of waterlogging, or soil differences resulting from the climate or vegetation. The names of suborders have two syllables. The last syllable indicates the order. An example is *Aquent* (*Aqu,* meaning water or wet, and *ent* from Entisol).

GREAT GROUP. Soil suborders are separated into great groups on the basis of uniformity in the kinds and sequence of major soil horizons and features. The horizons used to make separations are those in which clay, iron, or humus have accumulated; those that have pans that interfere with growth of roots; movement of water, or both; and thick, dark-colored surface horizons. The features used are the self-mulching properties of clay, soil temperature, major differences in chemical composition (mainly calcium, magnesium, sodium, and potassium), dark-red and dark-brown colors associated with basic rocks, and the like. The names of great groups have three or four syllables and are made by adding a prefix to the name of the suborder. An example is *Haplaquents* (*Hapl,* meaning simple horizons, *aqu* for wetness or water, and *ent,* from Entisols).

SUBGROUP. Great groups are subdivided into subgroups, one representing the central (typic) segment of the group and others, called intergrades, that have properties of the group and also one or more properties of another great group, suborder, or order. Subgroups may also be made in those instances where soil properties intergrade outside of the range of any other great group, suborder, or order. The names of subgroups are derived by placing one or more adjectives before the name of the great group. An example is *Typic Haplaquents* (a typical Haplaquent).

FAMILY. Soil families are separated within a subgroup primarily on the basis of properties important to the growth of plants or on the behavior of soils when used for engineering. Among the properties considered are texture, mineralogy, reaction, soil temperature, permeability, thickness of horizons, and consistence. A family name consists of a series of adjectives preceding the subgroup name. The adjec-

TABLE 11.—*Soil series classified by higher categories*

Series	Family	Subgroup	Order
Appling	Clayey, kaolinitic, thermic	Typic Hapludults	Ultisols.
Ashe	Coarse-loamy, mixed, mesic	Typic Dystrochrepts	Inceptisols.
Brevard	Fine-loamy, mixed, mesic	Typic Hapludults	Ultisols.
Buncombe	Mixed, thermic	Typic Udipsaments	Entisols.
Cartecay	Coarse-loamy, mixed, nonacid, thermic	Aquic Udifluvents	Entisols.
Cataula	Clayey, kaolinitic, thermic	Typic Fragiudults	Ultisols.
Cecil	Clayey, kaolinitic, thermic	Typic Hapludults	Ultisols.
Chewacla	Fine-loamy, mixed, thermic	Fluvaquentic Dystrochrepts	Inceptisols.
Cleveland	Loamy, mixed, mesic	Lithic Dystrochrepts	Inceptisols.
Congaree	Fine-loamy, mixed, nonacid, thermic	Typic Udifluvents	Entisols.
Durham	Fine-loamy, siliceous, thermic	Typic Hapludults	Ultisols.
Edneyville	Fine-loamy, mixed, mesic	Typic Hapludults	Ultisols.
Evard	Fine-loamy, oxidic, mesic	Typic Hapludults	Ultisols.
Fannin	Fine-loamy, micaceous, mesic	Typic Hapludults	Ultisols.
Haywood	Coarse-loamy, mixed, mesic	Cumulic Haplumbrepts	Inceptisols.
Helena	Clayey, mixed, thermic	Aquic Hapludults	Ultisols.
Hiwassee	Clayey, kaolinitic, thermic	Typic Rhodudults	Ultisols.
Louisburg	Coarse-loamy, mixed, thermic	Ruptic-Ultic-Dystrochrepts	Inceptisols.
Madison	Clayey, kaolinitic, thermic	Typic Hapludults	Ultisols.
Pacolet	Clayey, kaolinitic, thermic	Typic Hapludults	Ultisols.
Porters	Fine-loamy, mixed, mesic	Humic Hapludults	Ultisols.
Saluda	Loamy, mixed, mesic, shallow	Typic Hapludults	Ultisols.
Talladega	Loamy-skeletal, mixed, mesic	Ruptic-Lithic Entic Hapludults	Ultisols.
Toccoa	Coarse-loamy, mixed, nonacid, thermic	Typic Udifluvents	Entisols.
Wehadkee	Fine-loamy, mixed, nonacid, thermic	Typic Fluvaquents	Entisols.
Wickham	Fine-loamy, mixed, thermic	Typic Hapludults	Ultisols.

[1] Some of these soils are taxadjuncts to the Talladega series because the hue of the Bt horizon is dominantly 2.5YR, whereas that of the Talladega series is 5YR.

tives are the class names for texture, mineralogy, and so on that are used to differentiate families as shown in table 11. An example is the coarse-loamy, siliceous, acid, thermic family of Typic Haplaquents.

Additional Facts About the County

The physiography, geology, drainage, and climate of Greenville County are discussed in this section.

Physiography, Geology, and Drainage

About one-fourth, the northern part, of Greenville County is on the Blue Ridge Mountains, and the southern three-fourths is on the Piedmont Plateau. The general slope is southeastward, which is the general direction of the main drainageways. The land ranges from nearly level to very steep, but most areas in the mountains are strongly sloping to very steep, and in the Piedmont most areas are gently sloping to moderately steep.

The total area of the flood plains and stream terraces is small. Except for moderately steep and steep escarpments adjacent to the flood plains, stream terraces are gently sloping. The highest point in the county, about 3,297 feet above sea level, is on White Oak Mountain in the north-central part of the county at the North Carolina line. In the central part, the elevation ranges from 750 to 1,050 feet. In the central part of the county, Paris and Roper rise above the surrounding land and do not conform to the general pattern of relief. The lowest elevation is on the Saluda River in the extreme southern part of the county near the Laurens County line.

In Greenville County, there are eight geologic formations (*5*). These formations are made up of alluvium, fine-grained rocks, fine-grained to medium-grained rocks, fine-grained to coarse-grained rocks, medium-grained rocks, and coarse-grained rocks. Alluvium consists of material recently deposited on flood plains. The fine-grained rocks are diabase dikes that cut across formations of granite and gneiss. The fine-grained to medium-grained rocks are biotite gneiss, biotite schist, and megmatite. The fine-grained to coarse-grained rocks are biotite schist and hornblende gneiss. The medium-grained rocks are biotite granite gneiss and granite undivided. The coarse-grained rocks are muscovite pegmatite dikes.

The rivers, creeks, and smaller streams in Greenville County form a well-defined drainage pattern. Except for a small area in the northeast corner of the county, the main streams flow southeastward. In the northeast corner, the streams flow northeastward into the South Pacolet River. The major streams that drain the county, except for the small area in the northeast corner, are the North, Middle, and South Saluda, Reedy, Enoree, and South and Middle Tyger Rivers (*5*). Their chief tributaries are Matthews, Beaverdam, Grove, Huff, Horse Pen, and Green Creeks.

Climate [6]

Most of Greenville County has a temperate climate that is characterized by mild winters and warm summers. Precipitation is rather well distributed throughout the year. A little less than 3 inches is measured in May and November, and more than 5 inches is measured in March and July. During fall, winter, and spring, the weather is controlled largely by the west to east motion of fronts, cyclones, and air masses. Air mass exchanges are infrequent in summer, and maritime tropical air persists in the area for long periods. Table 12 gives temperature and precipitation data, and table 13 shows the probabilities of freezing temperatures in Greenville County.

About one-fourth of the county is about 1,200 feet above sea level. The other three-fourths of the county ranges in elevation from 700 to 1,200 feet. Somewhat colder conditions prevail above the 1,200-foot level and rainfall is somewhat heavier. Although the southern two-thirds of the county receives from 47 to 51 inches of rainfall annually, Caesar's Head (at the northern border of the county at an elevation of 3,115 feet) receives 75 inches. Caesar's Head also has an annual average temperature some seven degrees colder than the city of Greenville.

Wind and humidity records at the airport at Greenville show that the prevailing winds are from the northeast in autumn and winter and from the southwest in spring and summer. The average windspeed is about 8 miles per hour, whereas the strongest observed one-minute windspeed was 70 miles per hour. The latest averages of relative humidity at 1 p.m. are 53 percent in winter, 49 percent in spring, 51 percent in summer, and 52 percent in autumn. Corresponding values at 7 a.m. are 75 percent, 76 percent, 82 percent, and 81 percent, respectively.

The average year in Greenville County produces about 70 days with one-tenth inch or more of rain. During the entire year the sun is visible during 62 percent of the daylight hours. Percentages range from 55 in February to 71 in August. The sky is cloudy to overcast about 42 percent of the time. About 2 percent of the time the clouds are below an altitude of 500 feet, and 6 percent of the time they are below an altitude of 1,000 feet. Annual rainfall has varied from a high of 67 inches in 1929 to less than 32 inches in 1938. Normal annual precipitation is about 48 inches.

Summers are warm and long; they have an average of 56 days when the temperature rises to 90° F. or higher. Because of the elevation, the maximum temperature seldom reaches 100° F. A little more than one-fourth of the annual rainfall occurs in summer, mostly as showers and thunderstorms.

Autumn is warm and pleasant. It is the driest season of the year, and Indian Summer prevails. The average date of the first freezing temperature in autumn is November 7, and in 1 year out of 10, a frost occurs as early as October 28.

Winter is mild and has a minimum temperature of 32° or less on 5 out of 9 days. Snowfalls occur every

[6] By HOLBROOK LANDERS, climatologist for South Carolina, National Weather Service, U.S. Department of Commerce, Clemson.

TABLE 12.—*Temperature and precipitation data, Greenville County*

Month	Temperature				Precipitation				
	Average daily maximum	Average daily minimum	Two years in 10 will have at least 4 days with [1]—		Average total	One year in 10 will have—		Days with snow cover of 1 inch or more	Average depth of snow on days with snow cover
			Maximum temperature equal to or higher than—	Minimum temperature equal to or lower than—		Less than—	More than—		
	°F	°F	°F	°F	*Inches*	*Inches*	*Inches*	*Number*	*Inches*
January	52	35	70	19	4.3	1.6	7.7	1	2.0
February	54	36	70	22	4.3	1.3	7.8	1	1.3
March	62	42	76	28	5.3	3.0	8.7	1	1.3
April	71	50	85	39	4.5	1.2	7.5	0	----------
May	79	58	92	45	2.9	1.1	4.8	0	----------
June	87	66	95	56	3.2	1.8	4.5	0	----------
July	88	69	97	64	5.2	2.7	7.8	0	----------
August	86	68	96	62	4.8	1.6	8.4	0	----------
September	82	64	93	52	3.9	.9	8.2	0	----------
October	72	53	84	37	3.2	.5	8.1	0	----------
November	61	42	76	27	3.0	.8	5.6	0	([1])
December	52	36	67	22	3.8	1.9	7.2	([2])	.4
Year	71	52	[3] 99	[4] 12	48.4	38.8	56.3	4	1.4

[1] Trace, less than 0.05 inch.
[2] Less than one-half day.
[3] Average annual highest temperature.
[4] Average annual lowest temperature.

TABLE 13.—*Probabilities of last freezing temperatures in spring and first in fall, Greenville County*

Probability	Dates for given probability at temperature of—		
	24° F. or lower	28° F. or lower	32° F. or lower
Spring:			
1 year in 10 later than	March 22	March 28	April 17
2 years in 10 later than	March 16	March 22	April 10
5 years in 10 later than	February 21	March 10	March 23
Fall:			
1 year in 10 earlier than	November 8	November 4	October 28
2 years in 10 earlier than	November 20	November 8	November 3
5 years in 10 earlier than	December 1	November 22	November 7

winter, but significant amounts come only once every 2 or 3 years. Winter temperatures fall to 20° or less on 6 days and to 15° or less on 2 days. Winter rainfall is about one-fourth of the annual total and is associated with fronts and traveling cyclones. The mountains, which are oriented northeast-southwest, provide some protection against masses of cold winter air that move in from the northwest.

Spring is a period of change between the end of a rather uniform winter and the beginning of a rather uniform summer. Although March is a month of heavy rain, there is a decrease in rainfall in April, and a dry period occurs from late in April through June. Steady rains of the winter type are likely to occur early in spring, and scattered thunderstorm activity begins late in spring as winter gives way to summer. The average date of the last freezing temperature in spring is March 23.

Severe weather can occur as tornadoes and as tropical storms and hurricanes. There have been 11 tornadoes in Greenville County in the last 55 years. No full-fledged hurricane has visited the county in 50 years; however the less violent tropical storms affect the area about 1 year in every 5 to 10, and these storms bring heavy rain and minor wind damage.

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Glossary

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern.

Available water capacity (also termed available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of clay on the surface of a soil aggregate. Synonyms: clay coat, clay skin.

Colluvium. Soil material, rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex, soil. A mapping unit consisting of different kinds of soils that occur in such small individual areas or in such an intricate pattern that they cannot be shown separately at the scale used in mapping.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material, and tends to stretch somewhat and pull apart, rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard and brittle; little affected by moistening.

Fragipan. A loamy, brittle, subsurface horizon that is very low in organic-matter content and clay but is rich in silt or very fine sand. The layer is seemingly cemented. When dry, it is hard or very hard and has a high bulk density in comparison with the horizon or horizons above it. When moist, the fragipan tends to rupture suddenly if pressure is applied, rather than to deform slowly. The layer is generally mottled, is slowly or very slowly permeable to water, and has few or many bleached fracture planes that form polygons. Fragipans are a few inches to several feet thick; they generally occur below the B horizon, 15 to 40 inches below the surface.

Gleyed soil. A soil in which waterlogging and lack of oxygen have caused the material in one or more horizons to be neutral gray in color. The term "gleyed" is applied to soil horizons with yellow and gray mottling caused by intermittent waterlogging.

Horizon, soil. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes. These are the major horizons:

O horizon.—The layer of organic matter on the surface of a mineral soil. This layer consists of decaying plant residues.

A horizon.—The mineral horizon at the surface or just below an O horizon. This horizon is the one in which living organisms are most active and therefore is marked by the accumulation of humus. The horizon may have lost one or more of soluble salts, clay, and sesquioxides (iron and aluminum oxides).

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or some combination of these; (2) by prismatic or blocky structure; (3) by redder or stronger colors than the A horizon; or (4) by some combination of these. Combined A and B horizons are usually called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.—The weathered rock material immediately beneath the solum. In most soils this material is presumed to be like that from which the overlying horizons were formed. If the material is known to be different from that in the solum, a Roman numeral precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock usually underlies a C horizon but may be immediately beneath an A or B horizon.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineralogical, and biological properties of the various horizons, and their thickness and arrangement in the soil profile.

Mottling, soil. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage. Descriptive terms are as follows: Abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are these: *fine,* less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; *medium,* ranging from 5 millimeters to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and *coarse,* more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Parent material. Disintegrated and partly weathered rock from which soil has formed.

Ped. An individual natural soil aggregate, such as a crumb, a prism, or a block, in contrast to a clod.

Permeability. The quality that enables the soil to transmit water or air. Terms used to describe permeability are as follows: *very slow, slow, moderately slow, moderate, moderately rapid, rapid,* and *very rapid.*

pH value. A numerical means for designating acidity and alkalinity in soils. A pH value of 7.0 indicates precise neutrality; a higher value, alkalinity; and a lower value, acidity.

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. An acid, or "sour," soil is one that gives an acid reaction; an alkaline soil is one that is alkaline in reaction. In words, the degrees of acidity or alkalinity are expressed thus:

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock. Only the upper part of this, modified by organisms and other soil-building forces, is regarded by soil scientists as soil. Most American engineers speak of the whole regolith, even to great depths, as "soil."

Relief. The elevations or inequalities of a land surface, considered collectively.

Rill. A steep-sided channel resulting from accelerated erosion. A rill normally is a few inches in depth and width and is not large enough to be an obstacle to farm machinery.

Sand. Individual rock or mineral fragments in a soil that range in diameter from 0.05 to 2.0 millimeters. Most sand grains consist of quartz, but they may be of any mineral composition. The textural class name of any soil that contains 85 percent or more sand and not more than 10 percent clay.

Saprolite. Thoroughly decomposed but untransported rock.

Silt. Individual mineral particles in a soil that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). Soil of the silt textural class is 80 percent or more silt and less than 12 percent clay.

Soil. A natural, three-dimensional body on the earth's surface that supports plants and that has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Solum. The upper part of a soil profile, above the parent material, in which the processes of soil formation are active. The solum in mature soil includes the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristic of the soil are largely confined to the solum.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, about 5 to 8 inches in thickness. The plowed layer.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Tilth, soil. The condition of the soil in relation to the growth of plants, especially soil structure. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable, granular structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Water table. The highest part of the soil or underlying rock material that is wholly saturated with water. In some places an upper, or perched, water table may be separated from a lower one by a dry zone.

GUIDE TO MAPPING UNITS

For the full description of a mapping unit, read both the description of the mapping unit and the description of the soil series to which the mapping unit belongs. For information on use of the soils for woodland, see the section beginning on page 36, including table 4 on page 39 and table 5 on page 43. Other information is given in tables as follows:

Acreage and extent, table 1, page 6.
Suitability for crops, table 2, page 36.
Predicted yields, table 3, page 38.
Wildlife habitat, table 6, page 44.
Use of the soils for engineering, table 7, page 46; table 8, page 48; and table 9, page 54.
Town and country planning, table 10, page 60.

Map symbol	Mapping unit	Described on page	Capability unit		Woodland suitability group
			Symbol	Page	Symbol
ApB	Appling sandy loam, 2 to 6 percent slopes	7	IIe-2	32	3o7
ApC	Appling sandy loam, 6 to 10 percent slopes	7	IIIe-2	33	3o7
ASG	Ashe-Cleveland association, very steep	8	VIIe-2	35	-----
	Ashe soils	--	------	--	3r3
	Cleveland soils	--	------	--	4d3
ATG	Ashe-Cleveland association, stony, very steep	8	VIIe-2	35	-----
	Ashe soils	--	------	--	3x3
	Cleveland soils	--	------	--	4x3
AvF	Ashe and Cleveland soils, 15 to 40 percent slopes	8	VIIe-2	35	-----
	Ashe soils	--	------	--	3r2
	Cleveland soils	--	------	--	4d3
BrC	Brevard fine sandy loam, 6 to 10 percent slopes	9	IIIe-2	33	2o7
BrD	Brevard fine sandy loam, 10 to 15 percent slopes	9	IVe-1	33	2o7
BsC2	Brevard sandy clay loam, 2 to 10 percent slopes, eroded	9	IVe-1	33	2o7
BsE2	Brevard sandy clay loam, 10 to 25 percent slopes, eroded	9	VIe-1	35	2r8
BvE	Brevard-Evard complex, 15 to 25 percent slopes	9	VIe-1	35	-----
	Brevard soils	--	------	--	2r8
	Evard soils	--	------	--	3r2
BwB	Buncombe loamy sand, 2 to 5 percent slopes	10	IIIs-2	33	2s8
Ca	Cartecay and Chewacla soils	10	IIIw-2	33	-----
	Cartecay soils	--	------	--	2w8
	Chewacla soils	--	------	--	1w8
Cb	Cartecay and Toccoa soils	11	IIIw-2	33	-----
	Cartecay soils	--	------	--	2w8
	Toccoa soils	--	------	--	1o7
CdB2	Cataula sandy loam, 2 to 6 percent slopes, eroded	11	IIIe-3	33	3o7
CdC2	Cataula sandy loam, 6 to 10 percent slopes, eroded	12	IVe-2	34	3o7
CeB	Cecil sandy loam, 2 to 6 percent slopes	13	IIe-1	32	3o7
CeC	Cecil sandy loam, 6 to 10 percent slopes	13	IIIe-1	33	3o7
CeD	Cecil sandy loam, 10 to 15 percent slopes	13	IVe-1	33	3o7
ClB2	Cecil clay loam, 2 to 6 percent slopes, eroded	13	IIIe-1	33	3o7
ClC2	Cecil clay loam, 6 to 10 percent slopes, eroded	13	IVe-1	33	3o7
CuC	Cecil-Urban land complex, 2 to 10 percent slopes	14	------	--	3o7
CuE	Cecil-Urban land complex, 10 to 25 percent slopes	14	------	--	3r8
Cv	Chewacla soils	15	IIIw-2	33	1w8
Cw	Congaree fine sandy loam	16	IIw-2	32	1o7
DuB	Durham loamy sand, 2 to 6 percent slopes	17	IIe-2	32	3o7
EdC	Edneyville fine sandy loam, 6 to 10 percent slopes	17	IIIe-2	33	2o7
EdD	Edneyville fine sandy loam, 10 to 15 percent slopes	17	IVe-1	33	2o7
EdE	Edneyville fine sandy loam, 15 to 25 percent slopes	17	VIe-1	35	2r8
EeF	Edneyville soils, 25 to 40 percent slopes	17	VIIe-2	35	2r8
EHG	Edneyville and Ashe soils, very steep	18	VIIe-2	35	-----
	Edneyville soils	--	------	--	2r9
	Ashe soils	--	------	--	3r3

Map symbol	Mapping unit	Described on page	Capability unit		Woodland suitability group
			Symbol	Page	Symbol
EVF	Evard-Brevard association, steep	18	VIIe-2	35	-----
	Evard soils	--	------	--	3r2
	Brevard soils	--	------	--	2r8
FaF	Fannin fine sandy loam, 15 to 40 percent slopes	20	VIIe-2	35	2r8
HaD	Haywood loam, 6 to 15 percent slopes	20	IIIe-2	33	2o7
HbB	Helena sandy loam, 2 to 6 percent slopes	21	IIe-3	32	3w8
HeB	Hiwassee sandy loam, 2 to 6 percent slopes	22	IIe-1	32	3o7
HeC	Hiwassee sandy loam, 6 to 10 percent slopes	22	IIIe-1	33	3o7
HeD	Hiwassee sandy loam, 10 to 15 percent slopes	22	IVe-1	33	3o7
HeE	Hiwassee sandy loam, 15 to 25 percent slopes	22	VIe-1	35	3r8
HlB2	Hiwassee clay loam, 2 to 6 percent slopes, eroded	22	IIIe-1	33	3o7
HlD2	Hiwassee clay loam, 6 to 15 percent slopes, eroded	22	VIe-1	35	3o7
LuD	Louisburg loamy sand, 6 to 15 percent slopes	23	VIe-2	35	3o7
LuF	Louisburg loamy sand, 15 to 40 percent slopes	23	VIIe-2	35	3r8
McB	Madison sandy loam, 2 to 6 percent slopes	23	IIe-1	32	3o7
McC	Madison sandy loam, 6 to 10 percent slopes	24	IIIe-1	33	3o7
McD	Madison sandy loam, 10 to 15 percent slopes	24	IVe-1	33	3o7
McE	Madison sandy loam, 15 to 25 percent slopes	24	VIe-1	35	3r8
MdC2	Madison clay loam, 6 to 10 percent slopes, eroded	24	IVe-1	33	3o7
MdD2	Madison clay loam, 10 to 15 percent slopes, eroded	24	VIe-1	35	3o7
PcE	Pacolet sandy loam, 15 to 25 percent slopes	25	VIe-1	35	3r8
PcF	Pacolet sandy loam, 25 to 40 percent slopes	25	VIIe-1	35	3r8
PdD2	Pacolet clay loam, 10 to 15 percent slopes, eroded	25	VIe-1	35	3o7
PdE2	Pacolet clay loam, 15 to 25 percent slopes, eroded	25	VIIe-1	35	3r8
PfE3	Pacolet soils, 10 to 25 percent slopes, severely eroded	25	VIIe-1	35	4c3e
PrD	Porters loam, 6 to 15 percent slopes	26	IVe-1	33	2o7
PrF	Porters loam, 15 to 40 percent slopes	27	VIIe-2	35	2r8
PrG	Porters loam, 40 to 70 percent slopes	27	VIIe-2	35	2r9
RoG	Rock land-Cleveland complex, 25 to 80 percent slopes	27	------	--	4d3
SeE	Saluda and Edneyville soils, 15 to 25 percent slopes	27	VIe-2	35	-----
	Saluda soils	--	------	--	3d2
	Edneyville soils	--	------	--	2r8
SeF	Saluda and Edneyville soils, 25 to 40 percent slopes	28	VIIe-2	35	-----
	Saluda soils	--	------	--	3d2
	Edneyville soils	--	------	--	2r8
SFG	Saluda and Edneyville soils, very steep	28	VIIe-2	35	-----
	Saluda soils	--	------	--	3d3
	Edneyville soils	--	------	--	2r9
TdG	Talladega soils, 40 to 80 percent slopes	29	VIIe-2	35	3r3
Ur	Urban land	29	------	--	-----
Wd	Wehadkee soils	30	IVw-1	34	1w9
WhB	Wickham sandy loam, 2 to 6 percent slopes	30	IIe-1	32	3o7

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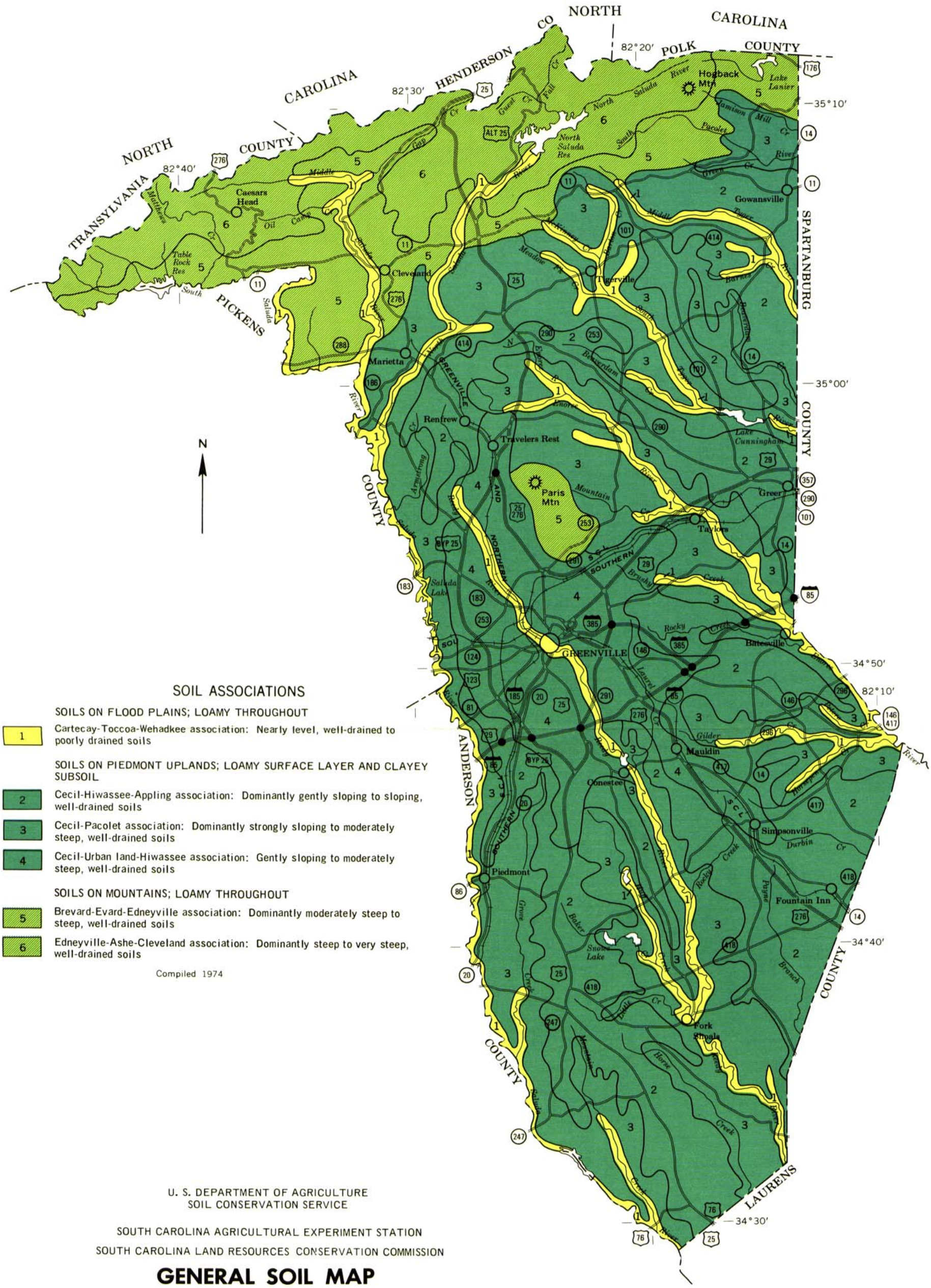

SOIL ASSOCIATIONS

SOILS ON FLOOD PLAINS; LOAMY THROUGHOUT

1 — Cartecay-Toccoa-Wehadkee association: Nearly level, well-drained to poorly drained soils

SOILS ON PIEDMONT UPLANDS; LOAMY SURFACE LAYER AND CLAYEY SUBSOIL

2 — Cecil-Hiwassee-Appling association: Dominantly gently sloping to sloping, well-drained soils

3 — Cecil-Pacolet association: Dominantly strongly sloping to moderately steep, well-drained soils

4 — Cecil-Urban land-Hiwassee association: Gently sloping to moderately steep, well-drained soils

SOILS ON MOUNTAINS; LOAMY THROUGHOUT

5 — Brevard-Evard-Edneyville association: Dominantly moderately steep to steep, well-drained soils

6 — Edneyville-Ashe-Cleveland association: Dominantly steep to very steep, well-drained soils

Compiled 1974

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOUTH CAROLINA AGRICULTURAL EXPERIMENT STATION

SOUTH CAROLINA LAND RESOURCES CONSERVATION COMMISSION

GENERAL SOIL MAP

GREENVILLE COUNTY, SOUTH CAROLINA

Scale 1:253,440

1 0 1 2 3 4 Miles

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.

Original text from each individual map sheet read:

Photobase from 1960 and 1970 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the South Carolina coordinate system, north zone.

This map is one of a set compiled in 1974 as part of a soil survey by the United States Department of Agricultural, Soil Conservation Service, and the South Carolina Agricultural Experiment Station, and the South Carolina Land Resources Conservation Commission.

INDEX TO MAP SHEETS

GREENVILLE COUNTY, SOUTH CAROLINA

Scale 1:253,440

1 0 1 2 3 4 Miles

SOIL LEGEND

The first letter, always a capital, is the initial letter of the soil name. The second letter is a capital if the mapping unit is broadly defined *; otherwise, it is a small letter. The third letter, always a capital, shows the slope. Symbols without slope letters are those of nearly level soils. A final number, 2 or 3, in the symbol shows that the soil is eroded or severely eroded.

SYMBOL	NAME
ApB	Appling sandy loam, 2 to 6 percent slopes
ApC	Appling sandy loam, 6 to 10 percent slopes
ASG	Ashe-Cleveland association, very steep
ATG	Ashe-Cleveland association, stony, very steep
AvF	Ashe and Cleveland soils, 15 to 40 percent slopes
BrC	Brevard fine sandy loam, 6 to 10 percent slopes
BrD	Brevard fine sandy loam, 10 to 15 percent slopes
BsC2	Brevard sandy clay loam, 2 to 10 percent slopes, eroded
BsE2	Brevard sandy clay loam, 10 to 25 percent slopes, eroded
BvE	Brevard-Evard complex, 15 to 25 percent slopes
BwB	Buncombe loamy sand, 2 to 5 percent slopes
Ca	Cartecay and Chewacla soils
Cb	Cartecay and Toccoa soils
CdB2	Cataula sandy loam, 2 to 6 percent slopes, eroded
CdC2	Cataula sandy loam, 6 to 10 percent slopes, eroded
CeB	Cecil sandy loam, 2 to 6 percent slopes
CeC	Cecil sandy loam, 6 to 10 percent slopes
CeD	Cecil sandy loam, 10 to 15 percent slopes
ClB2	Cecil clay loam, 2 to 6 percent slopes, eroded
ClC2	Cecil clay loam, 6 to 10 percent slopes, eroded
CuC	Cecil-Urban land complex, 2 to 10 percent slopes
CuE	Cecil-Urban land complex, 10 to 25 percent slopes
Cv	Chewacla soils
Cw	Congaree fine sandy loam
DuB	Durham loamy sand, 2 to 6 percent slopes
EdC	Edneyville fine sandy loam, 6 to 10 percent slopes
EdD	Edneyville fine sandy loam, 10 to 15 percent slopes
EdE	Edneyville fine sandy loam, 15 to 25 percent slopes
EeF	Edneyville soils, 25 to 40 percent slopes
EHG	Edneyville and Ashe soils, very steep
EVF	Evard-Brevard association, steep
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HaD	Haywood loam, 6 to 15 percent slopes
HbB	Helena sandy loam, 2 to 6 percent slopes
HeB	Hiwassee sandy loam, 2 to 6 percent slopes
HeC	Hiwassee sandy loam, 6 to 10 percent slopes
HeD	Hiwassee sandy loam, 10 to 15 percent slopes
HeE	Hiwassee sandy loam, 15 to 25 percent slopes
HlB2	Hiwassee clay loam, 2 to 6 percent slopes, eroded
HlD2	Hiwassee clay loam, 6 to 15 percent slopes, eroded
LuD	Louisburg loamy sand, 6 to 15 percent slopes
LuF	Louisburg loamy sand, 15 to 40 percent slopes
McB	Madison sandy loam, 2 to 6 percent slopes
McC	Madison sandy loam, 6 to 10 percent slopes
McD	Madison sandy loam, 10 to 15 percent slopes
McE	Madison sandy loam, 15 to 25 percent slopes
MdC2	Madison clay loam, 6 to 10 percent slopes, eroded
MdD2	Madison clay loam, 10 to 15 percent slopes, eroded
PcE	Pacolet sandy loam, 15 to 25 percent slopes
PcF	Pacolet sandy loam, 25 to 40 percent slopes
PdD2	Pacolet clay loam, 10 to 15 percent slopes, eroded
PdE2	Pacolet clay loam, 15 to 25 percent slopes, eroded
PfE3	Pacolet soils, 10 to 25 percent slopes, severely eroded
PrD	Porters loam, 6 to 15 percent slopes
PrF	Porters loam, 15 to 40 percent slopes
PrG	Porters loam, 40 to 70 percent slopes
RoG	Rock land-Cleveland complex, 25 to 80 percent slopes
SeE	Saluda and Edneyville soils, 15 to 25 percent slopes
SeF	Saluda and Edneyville soils, 25 to 40 percent slopes
SFG	Saluda and Edneyville soils, very steep
TdG	Talladega soils, 40 to 80 percent slopes
Ur	Urban land
Wd	Wehadkee soils
WhB	Wickham sandy loam, 2 to 6 percent slopes

* The composition of these units is more variable than that of others in the survey area but has been controlled well enough to be interpreted for the expected use of the soils.

CONVENTIONAL SIGNS

WORKS AND STRUCTURES

Highways and roads
- Divided
- Good motor
- Poor motor
- Trail

Highway markers
- National Interstate
- U. S.
- State or county

Railroads
- Single track
- Multiple track
- Abandoned

Bridges and crossings
- Road
- Trail
- Railroad
- Ferry (FY)
- Ford (FORD)
- Grade
- R. R. over
- R. R. under

Buildings
- School
- Church

Mine and quarry (QU.)

Gravel pit

Power line

Pipeline

Cemetery

Dams

Levee

Tanks

Well, oil or gas

Forest fire or lookout station

Windmill

Located object

BOUNDARIES

- National or state
- County
- Minor civil division
- Reservation
- Land grant
- Small park, cemetery, airport
- Land survey division corners

DRAINAGE

Streams, double-line
- Perennial
- Intermittent

Streams, single-line
- Perennial
- Intermittent
  - Crossable with tillage implements
  - Not crossable with tillage implements
- Unclassified

Canals and ditches

Lakes and ponds
- Perennial (water, w)
- Intermittent (int)

Spring

Marsh or swamp

Wet spot

Drainage end or alluvial fan

RELIEF

Escarpments
- Bedrock
- Other

Short steep slope

Prominent peak

Depressions

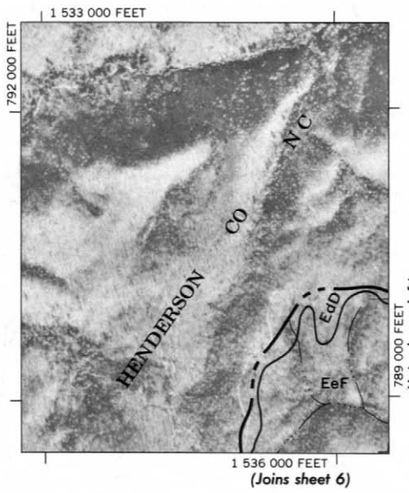
	Large	Small
Crossable with tillage implements		
Not crossable with tillage implements		
Contains water most of the time		

SOIL SURVEY DATA

- Soil boundary and symbol (Dx)
- Gravel
- Stoniness
  - Stony
  - Very stony
- Rock outcrops
- Chert fragments
- Clay spot
- Sand spot
- Gumbo or scabby spot
- Made land
- Severely eroded spot
- Blowout, wind erosion
- Gully

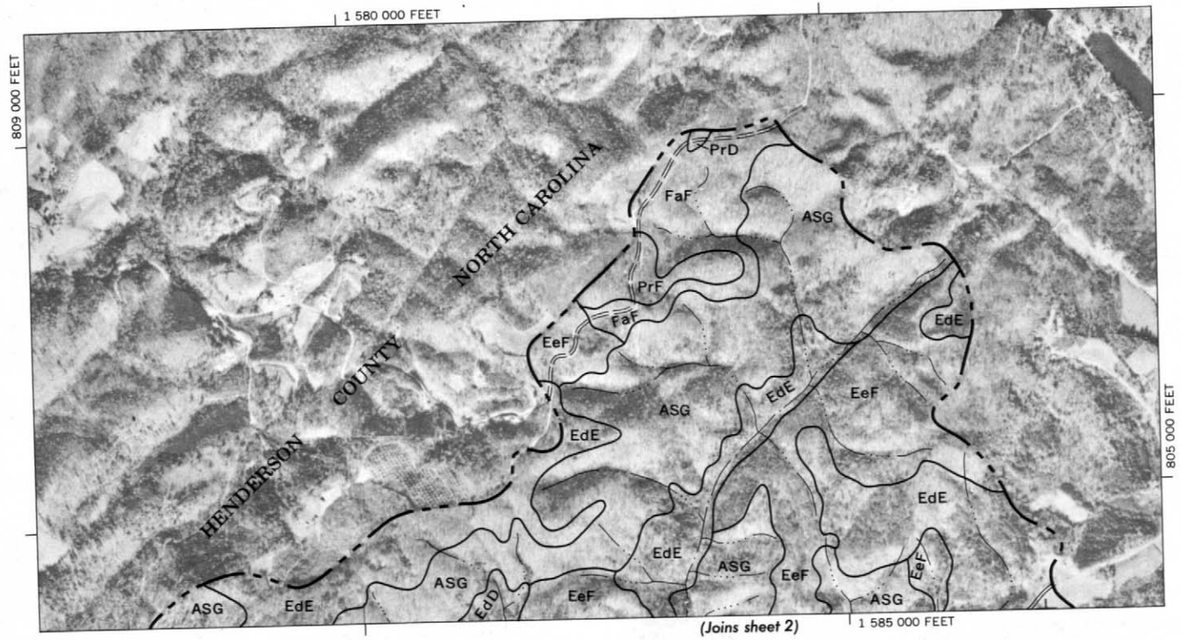
1 540 000 FEET

INSET A

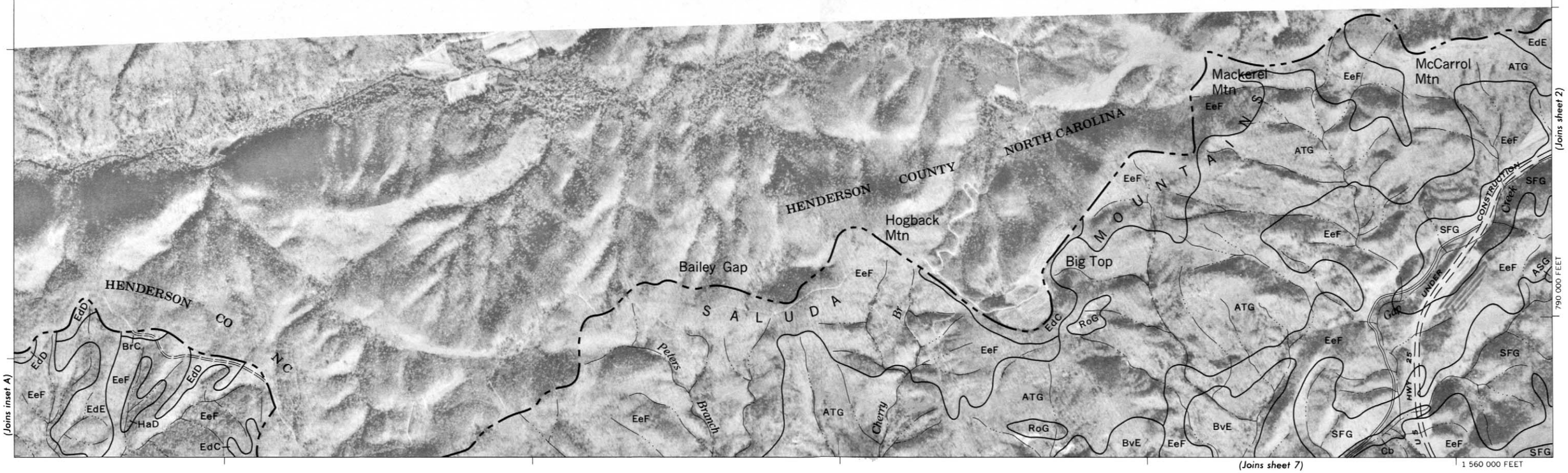


3000-FOOT GRID TICKS

INSET B



4000 AND 5000-FOOT GRID TICKS



800 000 FEET

N

1 Mile
5 000 Feet

Scale 1:20 000

(2)

N

1 Mile
5 000 Feet
0 0
Scale 1:20 000
¼ 1 000
½ 2 000
¾ 4 000
1 5 000

(Joins inset B, sheet 1)

1 585 000 FEET

800 000 FEET

790 000 FEET

1 565 000 FEET

(Joins sheet 1)

(Joins sheet 3)

(Joins sheet 8)

HENDERSON CO N C

NORTH CAROLINA

HENDERSON COUNTY

Vance Mtn

Walnut Mtn

Posey Mtn

Rocky Mtn

Frank Mtn

Panther Gap

Panther Mtn

Plumley Mtn

Chestnut Springs

NORTH SALUDA RESERVOIR

Dowdy Creek

Fall Creek

Guest Creek

Big Falls Creek

Terry Creek

Pruett Mtn

US HWY 25

CONSTRUCTION UNDER

Gap Creek

ASG EdE EdC EdD EeF EHG AvF HaD Cb PrG EdD EdC EeF EdE Cb EdC EdD Cw EVF SFG EeF EHG EVF SFG EeF EdD EeF BrC EVF Cb SFG BvE EHG PrF BvE EeF Cb EeF EHG Cb EeF EdE ASG AvF RoG EeF BvE ASG SFG EVF ATG EHG RoG Creek BvE SFG ATG EHG RoG SeF BvE SFG EeF SFG ASG

GREENVILLE COUNTY, SOUTH CAROLINA — SHEET NUMBER 3

3

N

1 590 000 FEET

800 000 FEET

HENDERSON COUNTY NORTH CAROLINA

POLK COUNTY NORTH CAROLINA

Alec Mtn

Trammel Gap

Pine Mtn

Brushy Ridge

Brushy Creek

Brushy Creek

Brice Creek

North Saluda River

Saluda River

NORTH SALUDA RESERVOIR

Hoghead Mtn

South Pacolet River

(Joins sheet 2)

(Joins sheet 4)

(Joins sheet 9)

790 000 FEET

1 610 000 FEET

1 Mile

5 000 Feet

Scale 1:20 000

1 000 0 1 000 2 000 3 000 4 000 5 000

¼ ½ ¾ 1

(4)

N

1 635 000 FEET

800 000 FEET

790 000 FEET

POLK COUNTY NORTH CAROLINA

SPARTANBURG COUNTY

Lanier Lake

Vaughn Creek

Jamison Mill Creek

Bird Mtn

Hogback Mtn

Hooker Ridge

S Pacolet R

Scale 1:20 000

1 Mile 5 000 Feet

0 ¼ ½ ¾ 1

0 1 000 2 000 3 000 4 000 5 000

(Joins sheet 3)

(Joins sheet 10)

1 615 000 FEET

GREENVILLE COUNTY, SOUTH CAROLINA — SHEET NUMBER 5

5

N

1 490 000 FEET

785 000 FEET

1 775 000 FEET

1 510 000 FEET

Quillen Mtn

TRANSYLVANIA COUNTY

NORTH CAROLINA

TENNESSEE VALLEY DIVIDE

Jones Gap

Matthews Creek

Middle Saluda River

ATG EdE EdD EdC EeF EHG SeE SFG Ca AvF BrD PrD PrF EVF BvE HaD RoG EdE 276

(Joins sheet 6)

(Joins sheet 12)

1 Mile

5 000 Feet

Scale 1:20 000

0 ¼ ½ ¾ 1

0 1 000 2 000 3 000 4 000 5 000

N

1 Mile 5 000 Feet

0 0

Scale 1:20 000

¼ 1 000

½ 2 000

¾ 3 000

1 4 000

5 000

1 535 000 FEET

785 000 FEET

775 000 FEET

1 515 000 FEET

(Joins inset A, sheet 1)

(Joins sheet 7)

(Joins sheet 5)

(Joins sheet 13)

NORTH CAROLINA

HENDERSON COUNTY

TRANSYLVANIA COUNTY

TENNESSEE VALLEY DIVIDE

Standingstone Mtn

Little Rich Mtn

Lake Rotary

Lake Sudy

Camp Greenville

Symmes Chapel

Foremost Head

Cox Camp Cr

Middle Saluda River

Rocky Branch

Coldspring Branch

Little Pinnacle Mountain

Oil Camp Cr

BrC BrD CaE CuC EdC EdD EdE EeF EHG EVF HaD PrD PrF SeE TdG ASG ATG AvF Cb Cr CW EvE RoG SFG WhB

(Joins sheet 1)

1 540 000 FEET

785 000 FEET

Cedar Rock Mtn

Osborne Mtn

Peters Cr

Tankersley Branch

Cherry Br

Creek

Gap Creek

Falls Creek

Little Falls Creek

Bluff Br

Head Creek

Foremost Creek

Friddle Lake

Timber Lands Lake

Saluda R

Middle Saluda River

Devils Fork

Beaverdam Creek

US-25 UNDER CONSTRUCTION

River Falls

Oil Camp Creek

(Joins sheet 6)

(Joins sheet 8)

(Joins sheet 14)

775 000 FEET

1 560 000 FEET

7

N

1 Mile 5 000 Feet

Scale 1:20 000

(Joins sheet 2)

1 585 000 FEET

785 000 FEET

N

Scale 1:20 000

1 Mile 5 000 Feet

0 0

¼ 1 000

½ 2 000

¾ 4 000

1 5 000

NORTH SALUDA RESERVOIR

Pluett Mtn

Cedar Mtn

Terry Creek

Hyde Mtn

Chestnut Mountain

Beaverdam Creek

Short Branch

Bonham Br

Calahan Br

North Saluda River

Winding Stair Gap Road

U.S. HIGHWAY 25

UPPER CONSTRUCTION

(Joins sheet 7)

(Joins sheet 9)

(Joins sheet 15)

1 565 000 FEET

775 000 FEET

SFG EeF Cb SeE EdE EVF EHG BrD BvE ASG EdD BrC BsE2 ATG RoG Cw Wd WnB SeF EdC Ca FaF

N

1 590 000 FEET

785 000 FEET

(Joins sheet 3)

(Joins sheet 8)

(Joins sheet 10)

770 000 FEET

1 610 000 FEET

(Joins sheet 16)

NORTH SALUDA RESERVOIR

Little Falls Creek

Bryant Mtn

Glassy Mountain

Mountain Hill Church

Glassy Rock

South Rutledge Branch

Calahan Branch

Middle Barton Creek

Mt Pleasant Church

Glassy Mt Church

Tyger River

Scale 1:20 000

1 Mile 5 000 Feet

(10)

N

1 Mile 5 000 Feet

0 0 Scale 1:20 000

¼ 1 000 ½ 2 000 ¾ 3 000 1 4 000 5 000

(Joins sheet 4)

(Joins sheet 9)

(Joins sheet 17)

1 635 000 FEET

785 000 FEET

770 000 FEET

1 615 000 FEET

South Pacolet River

Squirrel Mtn

Green Creek

Campbell Creek

Jamison Mill Creek

Pattie Creek

Paoget River

Gowensville

COUNTY

SPARTANBURG

PdD2 CeC PcE

N

INSET A

1 490 000 FEET

1 510 000 FEET

755 000 FEET

751 000 FEET

(Joins sheet 12)

(18)

(Joins inset B)

TABLE ROCK RESERVOIR

PICKENS COUNTY

SOUTH SALUDA RIVER

Flatrock Cr

Laurel Cr

Matthews Cr

AvF ATG EVF BvE Cb WhB BwB Cv BsC2 BsE2 HeB BrC

4000 AND 5000-FOOT GRID TICKS

INSET B

(Joins lower right)

1 475 000 FEET

1 485 000 FEET

755 000 FEET

750 000 FEET

(Joins inset A)

TRANSYLVANIA CO N C

PICKENS COUNTY

Sunfish Mtn

Sunfish Creek

Laurel Creek

Bigspring

SOUTH SALUDA RIVER

EdD EdE AvF ASG ATG PrF PrG HaD Cb EHG HeB

1 480 000 FEET

1 485 000 FEET

765 000 FEET

760 000 FEET

(Joins inset B)

(Joins sheet 12)

NORTH CAROLINA

TRANSYLVANIA COUNTY

Bigspring Mtn

Little Table Rock Cr

Rock Laurel Branch Creek

AvF EVF BvE EdE EdD ASG ATG RoG Cb

1 Mile

5 000 Feet

Scale 1:20 000

0 1/4 1/2 3/4 1

0 1 000 2 000 3 000 4 000 5 000

N

1 Mile
5 000 Feet

Scale 1:20 000

0 0
¼ 1 000
½ 2 000
¾ 3 000
1 4 000
5 000

(Joins sheet 11)

760 000 FEET

1 490 000 FEET

(Joins inset A, sheet 11)

(Joins sheet 5)

1 510 000 FEET

770 000 FEET

(Joins sheet 13)

NORTH CAROLINA

TRANSYLVANIA COUNTY

Raven Cliff

Buzzard Mtn

TABLE ROCK RES

Matthews Creek

Matthews

Little Table Rock Cr

Slicking Creek

Galloway Branch

Julian Creek

Creek

Bridge

Pedrock

EdC EdE EeF EdD PrD PrF SeE SeF SFG ASG Ca Cr EHG EeF EdD EVF SFG EeF ATG RoG EdD EHG 276 EdE EeF EdC Ca EeF EdC EdE EdD EeF ASG ASG EeF EdD ATG ATG EVF ATG BvE EeF PrF PrF BvE EdC Ca BvE ATG EdE PrF EdD BvE BrC EeF EeF ASG EVF ATG SFG HaD EVF EdE EeF Cb EdE AvF ASG AvF EeF EdE Cb ASG ASG AvF EdD EeF HaD EHG ATG SFG SFG ATG EVF HaD EVF ATG EHG RoG AvF ATG HaD ATG BvE ASG EdE EHG ATG EeF ASG AvF ATG BrD EdE SFG HaD BvE EVF HaD BvE SFG EeF Wd EVF ASG RoG ATG AvF ASG SFG BrC SeF EVF EVF Cw SFG ATG ASG ASG EdE Cb EeF EdC ATG ATG BrC Cv BrD EVF BvE BvE Cb BvE EdC ATG RoG RoG RoG RoG RoG RoG EVF EdC EeF AvF BvE Cb BrD BsE2 WhB Cv BsE2 BwB BwB BrC Cb WhB BvE BvE Cb BvE WhB AvF EVF SeF EVF BvE

1 515 000 FEET

770 000 FEET

760 000 FEET

1 535 000 FEET

(Joins sheet 6)

(Joins sheet 12)

(Joins sheet 14)

(Joins sheet 18)

N

1 Mile

5 000 Feet

Scale 1:20 000

Caesars Head

Caesars Head

Campbell Mountain

Camp Oil Creek

Cb

West Fork Cw

Wattacoo Creek

Robinson Branch

Matthews Cr

Mountain Lake

water

SOUTH SALUDA RIVER

PICKENS COUNTY

Tall Pine Lakes

276

11

EHG EdD EeF SFG EdC PrF PrG RoG ATG TdG SeE SeF EdE BsE2 HaD ASG EVF Cb BvE BrC Cw BwB BrD FaF WhB

(14)

N

1 Mile
5 000 Feet
Scale 1:20 000

(Joins sheet 7)

1 560 000 FEET

770 000 FEET

760 000 FEET

(Joins sheet 13)

(Joins sheet 15)

(Joins sheet 19)

1 540 000 FEET

Tankersley Lake

Devils Fork

Middle Creek

Cox Creek

Mill Creek

Saluda River

North Saluda River

Cleveland

Middle River Church

Cox Chapel

Mill Creek

SFG ATG EeF EdE EdD EdC EVF BvE BrD BrC FaF SeF RoG McC BsE2 BsC2 BwB Cw Cv Cb Ca

1 565 000 FEET

770 000 FEET

(Joins sheet 8)

15

N

1 Mile

5 000 Feet

Scale 1:20 000

Lake Mollirene

Lake Chinquapin

Cross Plains

Cross Plains Church

Lazy Water Lake

Poplar Lake

Dysart Lake

Allen Knob

Hill Top Ch.

Lima

Lima Church

Saluda River

North Saluda River

Mill Cr.

Spring Creek

North Spring Creek

McKinney Creek

Meadow Fork

U.S. 25 UNDER CONSTRUCTION

(Joins sheet 14)

(Joins sheet 16)

(Joins sheet 20)

1 585 000 FEET

755 000 FEET

N

1 Mile 5 000 Feet

0 0 Scale 1:20 000

1/4 1 000

1/2 2 000

3/4 3 000

1 4 000

5 000

(Joins sheet 9)

(Joins sheet 15)

(Joins sheet 17)

(Joins sheet 21)

1 610 000 FEET

765 000 FEET

755 000 FEET

1 590 000 FEET

Middle Tyger River

Noe Creek

McKinney Creek

Beaverdam Creek

Barton Creek

Meadow Fork

Pax Mountain

Highland

Highland Church

New Salem Church

Tiger Church

Tigerville


1 615 000 FEET
765 000 FEET
(Joins sheet 10)
(Joins sheet 16)
(Joins sheet 22)
1 630 000 FEET
755 000 FEET
Tyger River
Middle Tyger River
Campbell Creek
Beaverdam Creek
Barnes Creek
Middle Tyger River
Tyger River
Ebenezer Church
Liberty Church
Pleasant Hill Church
SPARTANBURG COUNTY
N
1 Mile
5 000 Feet
Scale 1:20 000

N

(Inset A) (11)

(Joins sheet 13)

1 535 000 FEET

755 000 FEET

1 Mile

5 000 Feet

Scale 1:20 000

0 0

¼ 1 000

½ 2 000

¾ 3 000

1 4 000

5 000

740 000 FEET

1 515 000 FEET

(Joins inset, sheet 31)

(Joins sheet 19)

SOUTH SALUDA RIVER

PICKENS COUNTY

SALUDA RIVER

Tall Pine Lakes

Ben Hall

Little Mtn

MOODY CEMETERY

BrD WhB BvE Cw EVF SFG EeF EdE BrC BsC2 BsE2 SeF HID2 Cb CuC Wd 288

1 540 000 FEET

755 000 FEET

(Joins sheet 14)

N

1 Mile

5 000 Feet

Scale 1:20 000

0 0

1 000 ¼ 2 000 ½ 3 000 ¾ 4 000 1 5 000

Piney Mtn

Wolf Creek

Spring Br

Spout Br

MIDDLE SALUDA RIVER

Beaverdam Cb

Tallev Creek

Slater

Marietta

North Saluda River

South Saluda River

GRAND N

(Joins sheet 18)

(Joins sheet 20)

(Joins sheet 23)

740 000 FEET

1 560 000 FEET

N

Scale 1:20 000

1 Mile 5 000 Feet

(Joins sheet 15) (Joins sheet 19) (Joins sheet 21) (Joins sheet 24)

1 585 000 FEET 750 000 FEET 740 000 FEET 1 565 000 FEET

Golden Grove Church
Cool Springs Church
Meadow Fork Church
New Liberty Church
Mt Grove Church
Valley Lake
Lake Frances
Glenns Lake
Coon Top Ridge
Saluda River
Bull Creek
Mush Creek
Johnson Creek
North Saluda R

(Joins sheet 16)

(Joins sheet 20)

(Joins sheet 22)

(Joins sheet 25)

1 590 000 FEET

750 000 FEET

740 000 FEET

1 610 000 FEET

N

Scale 1:20 000

1 Mile

5 000 Feet

Meadow Fk

Mush Creek

Mush Creek Church

Pair Creek

South Tyger River

Wildcat Creek

Mt View

Mt View Ch

Mt View School

Blue Ridge School

Fews Chapel

Bryant Pond

Gum Springs Church

Beaverdam Creek

Locust Hill

South Tyger River

CeB CeC CeD PcE PcF Cb Wd HeB HeC HeD HID2 HIB2 PdD2 PdE2 CIC2 CIB2 BrC BrD BvE EVF ATG BsC2 BsE2 Cw HeB HeC HeD HID2 HIB2 PdD2 PdE2 CIC2 CIB2 BrC BrD BvE EVF ATG BsC2 BsE2 Cw

(Joins sheet 17)

(Joins sheet 21)

(Joins sheet 26)

N

1 635 000 FEET

750 000 FEET

740 000 FEET

1 615 000 FEET

1 Mile

5 000 Feet

Scale 1:20 000

0 0

¼ 1 000

½ 2 000

¾ 4 000

1 5 000

Skyland

Skyland School

Jordan

Blue Ridge

Berrys Millpond

Beaverdam Church

St Pauls Church

Middle Tyger River

Enoree River

SPARTANBURG COUNTY

Thompson Br

Phillips Creek

Beaverdam Creek

Flemmings Creek

CeB CeC CeD ApB ApC PcE HeB HeC HeD Wd Cb Cw Ca CuC DuB McB McC McD McE HbB HIB2 HID2 CIC2 CIB2 PdD2 WhB

(Joins inset, sheet 31)

(Joins sheet 19)

(Joins sheet 24)

(Joins sheet 27)

1 540 000 FEET

735 000 FEET

725 000 FEET

1 555 000 FEET

23

N

1 Mile

5 000 Feet

Scale 1:20 000

1 000 0 1 000 2 000 3 000 4 000 5 000

¼ ½ ¾ 1

N

1 585 000 FEET

735 000 FEET

725 000 FEET

1 560 000 FEET

1 Mile

5 000 Feet

Scale 1:20 000

0 ¼ ½ ¾ 1

0 1 000 2 000 3 000 4 000 5 000

(Joins sheet 20)

(Joins sheet 23)

(Joins sheet 25)

(Joins sheet 28)

Lindseys Lake

Enoree River

Beaverdam Creek

Bethel Church

Enoree Church

Renfrow

QUARRY

GREENVILLE AND NORTHERN

NORTH

25

276

(Joins sheet 21)

(Joins sheet 24)

(Joins sheet 26)

(Joins sheet 29)

1 590 000 FEET

735 000 FEET

1 605 000 FEET

720 000 FEET

Beaverdam

Long Branch

Enoree River

Sandy Flat

St Lukes Ch

Jackson Grove Church

Double Springs Church

South Tyger River

Beaverdam Creek

Clear Creek

25

N

1 Mile

5 000 Feet

Scale 1:20 000

N

1 Mile
5 000 Feet
Scale 1:20 000
0
1 000
2 000
3 000
4 000
5 000

(Joins sheet 22)
(Joins sheet 25)
(Joins sheet 30)

1 635 000 FEET
735 000 FEET
720 000 FEET
1 610 000 FEET

O'Neal
O'Neal Church
Milford Church
Beaverdam Creek
Tyger River
Clear Creek
Lake Cunningham
SPARTANBURG COUNTY

(Joins sheet 23)

(Joins sheet 28)

(Joins sheet 31)

1 535 000 FEET

720 000 FEET

705 000 FEET

1 555 000 FEET

27

N

Scale 1:20 000

1 Mile

5 000 Feet

SOUTH SALUDA RIVER

North Saluda River

SALUDA RIVER

PICKENS COUNTY

Forestville Church

St Johns Church

Twin Lakes

Hunts Lake

Belue Lake

Armstrong Creek

N

1 Mile

5 000 Feet

Scale 1:20 000

0 0

1/4 1 000

1/2 2 000

3/4 4 000

1 5 000

(Joins sheet 24)

1 580 000 FEET

720 000 FEET

705 000 FEET

1 560 000 FEET

(Joins sheet 27)

(Joins sheet 29)

(Joins sheet 32)

Travelers Rest

Little Texas

Grace Lake

Ready River Church

Mt. Sinai Church

FURMAN UNIVERSITY

Lookout Tower

Paris Mt. Country Club

Paris Mountain

Brissey Ridge

Mountain Lake

Piney Spur

Ready River

Ready River

Ready River

Ready River

Northern

Greenville

CeB CeC CeD HeB HeC HeD HID2 CuC Cb PcE PcF Wd WhB CIC2 CdB2 ClB2 HeE Cv CdC ApB BrC BrD BvE EVF PfE3 PdD2 RoG SFG TdG

N

1 585 000 FEET

720 000 FEET

(Joins sheet 25)

(Joins sheet 28)

(Joins sheet 30)

(Joins sheet 33)

1 605 000 FEET

705 000 FEET

Scale 1:20 000

1 Mile 5 000 Feet

Beaverdam Creek

Enoree River

Buckhorn Creek

Mountain Creek

Jubilee Church

Mt View Church

Pleasant View Church

Brissey Ridge

253

290

29

N

1 Mile 5 000 Feet

Scale 1:20 000

1 000 0 1 000 2 000 3 000 4 000 5 000

(Joins sheet 26)

(Joins sheet 29)

(Joins sheet 34)

1 630 000 FEET

715 000 FEET

705 000 FEET

1 610 000 FEET

Johnsons Lake

Fairview

Prokpauk Creek

Maple Creek

SEABOARD COAST LINE

SOUTHERN

GREER

SPARTANBURG COUNTY

1 535 000 FEET

705 000 FEET

PcF PcF PcE HeC CeC ApB (Joins sheet 27) CeC CeB

Ca CeD PcE PcF HeC HeD PdD2 Wd ApB CeD CeC HeC HeB HeD HeB HeC HeD HID2 PcE HeB HeC PcE HeD HeC PcE HeC PcE HeD Wd PcF PcE HeC HeB PcE HeC HeD HeC HeB CeB CeD CeC CeB CeC CeD PcE PdD2 CeB CeC CeD PcE PdD2 CeC CeB CIC2 CIC2 CeB CIC2 CeC PdD2 CeC PdD2 CIC2 PcE HeC HeD PcE HeD HeC HeD PcE HeC HeC PcE HeD PcE CeD CeC Cb PcE CeC CeD CeD CIC2 CeD CeC CeB CeB CeB CeB CeB CeB CeD CeC

SALUDA RIVER PICKENS COUNTY

Rutledge Lake

Saluda Lake

Coolbrooks Creek

(Joins sheet 32)

1 Mile 5 000 Feet

Scale 1:20 000

1 525 000 FEET

(Joins sheet 18)

738 000 FEET

734 000 FEET

(Joins 23)

EVF BrD HID2 BsE2 BsE2 HID2 WhB 288 Cw Cv HID2 BvE WhB Cw Cv Wd WhB BvE SFG Cv Wd Cv Cw Cw Wd WhB Cw Wd BrC

SOUTH SALUDA RIVER PICKENS COUNTY

1 535 000 FEET

4000 AND 5000-FOOT GRID TICKS

1 555 000 FEET

(Joins sheet 35)

690 000 FEET

N

1 Mile
5 000 Feet

Scale 1:20 000

0 1 000 2 000 3 000 4 000 5 000

(Joins sheet 31)

(Joins sheet 28)

1 580 000 FEET

700 000 FEET

690 000 FEET

1 560 000 FEET

(Joins sheet 36)

(Joins sheet 33)

FURMAN UNIVERSITY

Montague

Sharon Park

BEREA

GREENVILLE
(county seat)

Bruce Lake

Piney Mtn

Leawood

Paris Mtn

Reedy River

Little Creek

Langston Creek

Northern Bypass

Greenville Spartanburg

Coast Line

Seaboard Southern

(Joins sheet 29)

(Joins sheet 32)

(Joins sheet 34)

(Joins sheet 37)

1 585 000 FEET

1 605 000 FEET

700 000 FEET

690 000 FEET

N

Scale 1:20 000

1 Mile 0 5 000 Feet

1/4 1/2 3/4 1 000 2 000 3 000 4 000 5 000

TAYLORS

Mountain Creek

LINE

SEABOARD COAST SOUTHERN

Hampton Heights

Cherokee Forest

Paris

Brushy Creek

GREENVILLE
(county seat)

water

N

1 Mile
5 000 Feet

Scale 1:20 000

0 ¼ ½ ¾ 1

(Joins sheet 30) CeD

(Joins sheet 33)

(Joins sheet 38)

1 630 000 FEET

700 000 FEET

690 000 FEET

1 610 000 FEET

TAYLORS

Chick Springs

GREER

GREENVILLE-SPARTANBURG AIRPORT

SPARTANBURG COUNTY

Enoree Fork Church

water

Enoree River

Brushy Creek

Cane Creek

SEABOARD COAST LINE

SOUTHERN

Maple Cr.

1 535 000 FEET

685 000 FEET

1 553 000 FEET

(Joins lower right)

670 000 FEET

(Joins sheet 39)

660 000 FEET

1 558 000 FEET

(Joins sheet 31)

1 555 000 FEET

(Joins inset)

675 000 FEET

(Joins sheet 36)

N

1 Mile

5 000 Feet

Scale 1:20 000

0 ¼ ½ ¾ 1

0 1 000 2 000 3 000 4 000 5 000

PICKENS COUNTY

ANDERSON COUNTY

SALUDA RIVER

Lake Saluda

SALUDA DAM

SOUTHERN

N

1 Mile
5 000 Feet
Scale 1:20 000
1 000 2 000 3 000 4 000 5 000

1 580 000 FEET

685 000 FEET

675 000 FEET

1 560 000 FEET

(Joins sheet 32)

(Joins sheet 35)

(Joins sheet 37)

(Joins sheet 39)

GREENVILLE
(county seat)

Westville

West Greenville

Northgate

White Horse Heights

Reedy

Reedy River

Long Branch

Brushy Creek

SEABOARD COAST LINE

SOUTHERN

PCL

CuC CuE CeC CeB CeD CeE Wd Cv Cb Ur PcE PcD ClC2 ApB HeC HeD HeB HbB CdB2 HlD2 McD Ca

1 585 000 FEET

685 000 FEET

(Joins sheet 33)

(Joins sheet 36)

(Joins sheet 38)

(Joins sheet 40)

1 605 000 FEET

670 000 FEET

N

Scale 1:20 000

1 Mile

5 000 Feet

1 000

GREENVILLE
(county seat)

GREENVILLE AIRPORT

BOB JONES
UNIVERSITY

Lake Forest

Rock Hill
Church

Pine Grove Lake

Woods
Lake

Roper Mtn
Church

Roper
Mtn

Reedy
River

Rocky
Creek

Richland
Creek

SEABOARD
COAST
LINE

CuC CuE Ur Cb CeC CeD CeB CeE PcE PdD2 CIC2 CIB2 ApB Wd LuD HbB HeB

N

1 Mile
5 000 Feet
Scale 1:20 000
1 000
2 000
3 000
4 000
5 000

(Joins sheet 34)
(Joins sheet 37)
(Joins sheet 41)
(Joins inset, sheet 42)

1 630 000 FEET
685 000 FEET
670 000 FEET
1 610 000 FEET

Horseshoe Bend
Boiling Springs Church
Oak Grove Lake
Batesville
Ebenezer Church
Wesley Chapel
Brushy Creek
Enoree River
Rocky Creek
SPARTANBURG COUNTY

(Joins sheet 36)

1 560 000 FEET

670 000 FEET

GREENVILLE
(county seat)

White Horse

Bethlehem Church

Gantt

West Gantt

SOUTHERN

SEABOARD COAST LINE

Saluda River

Brushy Creek

ANDERSON COUNTY

(Joins inset, sheet 35)

(Joins sheet 40)

(Joins sheet 43)

1 580 000 FEET

655 000 FEET

39

N

1 Mile
5 000 Feet

Scale 1:20 000

N

1 Mile
5 000 Feet

Scale 1:20 000

(Joins sheet 37)

(Joins sheet 39)

(Joins sheet 41)

(Joins sheet 44)

1 605 000 FEET

665 000 FEET

655 000 FEET

1 585 000 FEET

Reedy River

Brushy Creek

Laurel Seaboard Coast Line

Laurens Road Church

CuC CuE Cb CeB CeC CeD HeB HeC HeD HID2 PtE3 PcE PcF PdD2 PdE2 ClC2 ClB2 Wd ApB ApC McC McD MdD2 MdC2 Ca Cv WhB

N

1 610 000 FEET

665 000 FEET

(Joins sheet 38)

(Joins sheet 40)

(Joins sheet 42)

(Joins sheet 45)

655 000 FEET

1 630 000 FEET

Rocky Creek Church

Mt Zion Church

Five Forks

Earls Lake

Little Gilder Creek

Gilder Creek

Peters Creek

Scale 1:20 000

1 Mile 5 000 Feet

N

1 Mile 5 000 Feet

0 0

Scale 1:20 000

1 000 2 000 3 000 4 000 5 000

¼ ½ ¾ 1

1 645 000 FEET

665 000 FEET

655 000 FEET

1 635 000 FEET

1 640 000 FEET

675 000 FEET

670 000 FEET

1 635 000 FEET

(Joins inset)

(Joins sheet 41)

(Joins sheet 38)

(Joins upper left)

(Joins sheet 46)

ENOREE RIVER

SPARTANBURG COUNTY

Crossroads Church

Peters Creek

Gilkey Creek

Horsepen Creek

Bruce Cr

CeC CeD CeB CIC2 CIB2 CdC2 CdB2 CdB PcE PcF Cb PdD2 LuD LuF Wa Wd ApB CdC2 HeC HeD HeB HID2 Cw Ca Cv WhB SwB PdE2 LaF

N

1 560 000 FEET

650 000 FEET

(Joins sheet 39)

(Joins sheet 44)

(Joins sheet 47)

1 580 000 FEET

640 000 FEET

Scale 1:20 000

1 Mile 0 5 000 Feet

1 000 2 000 3 000 4 000 5 000

¼ ½ ¾ 1

SALUDA RIVER

ANDERSON COUNTY

Lakeside Lake

QUARRY

Freeman Lake

Woodfields

East Gantt

Lakeside

Little Grove Creek

SOUTHERN COAST LINE

SEABOARD

MH Cr

Cb Creek

PcF MdD2 MdC2 ClC2 CuC PcE CeC CeD PdD2 PdE2 CeB LuD HbB HeB HeC ClB2 PfE3 HeE ApC Wd CuE HID2 HIB2 McD McC McE MdC2 ApB Ca

25 BYP 85 29 20 25

N

Scale 1:20 000

1 Mile 5 000 Feet

0 0

1 000 2 000 3 000 4 000 5 000

¼ ½ ¾ 1

(Joins sheet 40)

(Joins sheet 43)

(Joins sheet 45)

(Joins sheet 48)

1 605 000 FEET

650 000 FEET

640 000 FEET

1 585 000 FEET

DONALDSON INDUSTRIAL AREA

Reedy River

Conestee Lake

Creek

Bone Marrow Creek

Laurel Creek

Conestee

MAULDIN

SOUTHERN

GREENVILLE COUNTY, SOUTH CAROLINA — SHEET NUMBER 45

45

N

1 610 000 FEET

650 000 FEET

640 000 FEET

1 630 000 FEET

(Joins sheet 41)

(Joins sheet 44)

(Joins sheet 46)

(Joins sheet 49)

Scale 1:20 000

1 Mile

5 000 Feet

New Hope Church

Simpsonville Jr High School

Gilder Creek

Graze Creek

Horsepen Creek

Coast Line

Seaboard

N

1 Mile
5 000 Feet
Scale 1:20 000

(Joins sheet 42)

(Joins sheet 45)

(Joins sheet 50)

1 655 000 FEET

650 000 FEET

640 000 FEET

1 635 000 FEET

Bells Crossroads

Clear Spring Church

Goldlerd Crossroads

Horsepen Creek

Horsepen Branch

Whites Branch

Long Branch

Cedar Creek

Enoree R

SPARTANBURG CO

LAURENS COUNTY

GAS

417

CeC CeB CeD ApB ApC CIC2 CIB2 CdB2 CdC2 PcE PdD2 PdE2 HeB HeC HbB LuF LuD Cb Ca Wd BwB DuB

N

1 560 000 FEET

635 000 FEET

(Joins sheet 43)

(Joins sheet 48)

625 000 FEET

(Joins sheet 51)

1 580 000 FEET

1 Mile

5 000 Feet

Scale 1:20 000

Golden Grove

Freemans Lake

ANDERSON COUNTY

SALUDA

PIEDMONT

St Matthews Church

SOUTHERN COASTLINE RAILROAD

Reedy Creek

Grove Creek

Wd

CeC

CeD

CeB

McC

McD

McE

McB

MdD2

MdC2

PdD2

CIC2

CIB2

HIC2

HIB2

HID2

HeC

HeD

HeE

HeB

PcE

PcF

PfE3

PtE3

CdB2

CdC2

ApB

ApC

HbB

DuB

CuC

Cb

Ca

LuD

N

1 Mile 5 000 Feet

Scale 1:20 000

0 0

¼ 1 000

½ 2 000

¾ 3 000

1 4 000

5 000

(Joins sheet 44)

(Joins sheet 47)

(Joins sheet 52)

(Joins sheet 49)

1 605 000 FEET

1 635 000 FEET

625 000 FEET

1 585 000 FEET

DONALDSON INDUSTRIAL AREA

Mauldin

Reedy River

Huff Creek

Rocky Creek

Reedy River

Reedy River

Cypress Creek

Reedy River

25

N

1 610 000 FEET

635 000 FEET

(Joins sheet 45)

(Joins sheet 48)

(Joins sheet 50)

(Joins sheet 53)

620 000 FEET

1 630 000 FEET

Scale 1:20 000

1 Mile

5 000 Feet

SIMPSONVILLE

Gooch's Lake

Durbin Creek

Rocky Creek

Bethlehem Church

High School

SEABOARD COAST LINE

GAS LINE

OIL LINE

Payne Branch

Creek

water

CeB CeC CeD McB McC McD McE MdC2 MdD2 MdD2 PcE PcF PdD2 PdE2 PfE3 CdB2 CdC2 ClC2 ClB2 HlB2 ApB ApC HbB HeB HeC CuC DuB LuD LuF Wd Cb Cv WhB

N

1 Mile
5 000 Feet
Scale 1:20 000

(Joins sheet 46)

1 655 000 FEET

635 000 FEET

620 000 FEET

1 635 000 FEET

(Joins sheet 49)

(Joins sheet 54)

Durbin Creek

Howard Branch

Wilson Creek

COUNTY

LAURENS COUNTY

FOUNTAIN INN

SCL

1 560 000 FEET

620 000 FEET

(Joins sheet 47)

51

N

1 Mile

5 000 Feet

Scale 1:20 000

0 0

1/4 1 000

1/2 2 000

3/4 3 000

1 4 000

5 000

(Joins sheet 52)

605 000 FEET

(Joins sheet 55)

1 580 000 FEET

SOUTHERN

ANDERSON COUNTY

SEABOARD COAST LINE

RIVER

Creek

Grove Creek

Grove

Creek

Waycross Church

Mt Bethel Church

25

20

Wd

(Joins sheet 48)

1 605 000 FEET

N

1 Mile

5 000 Feet

Scale 1:20 000

(Joins sheet 51)

(Joins sheet 53)

615 000 FEET

605 000 FEET

(Joins sheet 56)

1 585 000 FEET

Baker Creek

Snows Lake

Sanoma School

Huff Creek

Kellets Lake

Huff Creek

Baker Creek

N

1 610 000 FEET

615 000 FEET

605 000 FEET

1 630 000 FEET

(Joins sheet 49)

(Joins sheet 52)

(Joins sheet 54)

(Joins sheet 57)

Scale 1:20 000

1 Mile

5 000 Feet

Unity Church

Reedy River

Rocky Cr.

Brushy Cr.

Payne

Rabon Creek

South Tyger River

Tyger River

GAS

OIL

276

418

N

1 Mile 5 000 Feet

Scale 1:20 000

0 1/4 1/2 3/4 1

0 1 000 2 000 3 000 4 000 5 000

(Joins sheet 50)

(Joins sheet 53)

(Joins sheet 57)

(Joins lower left)

(Joins inset)

1 655 000 FEET

1 638 000 FEET

1 635 000 FEET

1 633 000 FEET

615 000 FEET

600 000 FEET

590 000 FEET

605 000 FEET

FOUNTAIN INN

SEABOARD COAST LINE

Stoddard Creek

Payne Branch

LAURENS COUNTY

Wd ApB ApC CeB CeC CeD HbB DuB CuC PcE CIC2 PdD2 CIB2 HbG Cb LuD LuF CdB2 CdC


1 560 000 FEET
600 000 FEET
(Joins sheet 51)
ApC
East View School
East View
Grove Creek
Shady Grove Church
Washington Church
PELZER MILLS DAM
SALUDA
ANDERSON COUNTY
RIVER
Creek
(Joins sheet 56)
590 000 FEET
(Joins sheet 58)
1 580 000 FEET
55
N
1 Mile
5 000 Feet
Scale 1:20 000

N

1 Mile 5 000 Feet

Scale 1:20 000

0 1 000 ¼ ½ 2 000 3 000 ¾ 4 000 1 5 000

(Joins sheet 52)

(Joins sheet 55)

(Joins sheet 57)

(Joins sheet 59)

1 605 000 FEET

600 000 FEET

590 000 FEET

1 585 000 FEET

Woodville

Ellen Wood School

Ware Place

McKelvey Crossroads

Lickville

New Pleasant Grove Church

Fork Shoals

Little Creek

Mountain Creek

Horse Ct

Gas

Fluf

Lluf

Olt

1 610 000 FEET
600 000 FEET
590 000 FEET
1 630 000 FEET
(Joins sheet 53)
(Joins sheet 56)
(Joins sheet 60)
(Joins inset, sheet 54)
57
N
1 Mile
5 000 Feet
Scale 1:20 000
Fairview Church
Pisgah Church
Shady Oak Church
Fork Shoals
REEDY RIVER
Huff Cr
Payne Br
South Rabon Creek
Martin Creek
Rabon Creek
South Branch
LAURENS CO

N

1 Mile
5 000 Feet
Scale 1:20 000
0
5 000
1 000
2 000
3 000
4 000
¼
½
¾
1

1 580 000 FEET
585 000 FEET
570 000 FEET
575 000 FEET
565 000 FEET
1 575 000 FEET
1 560 000 FEET

(Joins sheet 55)
(Joins lower right)
(Joins sheet 61)
(Joins sheet 59)
(Joins inset)

ANDERSON COUNTY
SALUDA RIVER
Grove Creek
Beech Springs Church
Holly Springs Church
Cedar Shoals Church
OIL
GAS
W
Ca
Cb
CeB
CeC
CeD
PcE
PcF
PdD2
PdE2
CIC2
HeB
HeC
HeD
HID2
PfE3
McC
McD
McE
MdD2
MdC2
PdE2
WhB
ApB
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CIB2
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GREENVILLE COUNTY, SOUTH CAROLINA — SHEET NUMBER 59

1 585 000 FEET

585 000 FEET

(Joins sheet 56)

(Joins sheet 58)

(Joins sheet 60)

(Joins sheet 61)

1 605 000 FEET

570 000 FEET

59

N

Scale 1:20 000

1 Mile

5 000 Feet

Lickville Church

Morris Chapel

Deventon Church

Oak Hill Church

Mountain Creek

Horse Creek

Gas

N

1 Mile
5 000 Feet
Scale 1:20 000
0 0
¼ 1 000
½ 2 000
¾ 3 000
1 4 000
5 000

(Joins sheet 57)

1 630 000 FEET

585 000 FEET

(Joins sheet 59)

570 000 FEET

(Joins sheet 62)

1 610 000 FEET

Reedy River

Horse Creek

Martin Creek

Hillside Church

Sims

Duncan Twp

Lebanon Church

LAURENS COUNTY

GREENVILLE COUNTY, SOUTH CAROLINA — SHEET NUMBER 61

1 585 000 FEET

570 000 FEET

(Joins inset, sheet 58)

(Joins sheet 59)

(Joins sheet 62)

(Joins sheet 63)

555 000 FEET

1 605 000 FEET

61

N

1 Mile

5 000 Feet

Scale 1:20 000

Church of God

Mountain Creek

SALUDA

ANDERSON COUNTY

RIVER

Mountain Creek

Creek

25

N

1 Mile
5 000 Feet
0
Scale 1:20 000
1 000
2 000
3 000
4 000
5 000

(Joins sheet 60)
(Joins sheet 61)
(Joins sheet 63)
(Joins inset, sheet 63)

1 630 000 FEET
565 000 FEET
555 000 FEET
1 610 000 FEET

Horse Creek
Horse Creek
REEDY RIVER
GREENVILLE COUNTY
LAURENS COUNTY
25

PcE CeC Cb PdD2 CeB ClC2 CeD ApB LuD Ca McB McC MdD2 MdC2 PdE2 PfE3 CdC2 CdB2 ClB2 WhB HeB DuB McD McE PcF Cw Wd LuF

63

N

1 590 000 FEET

550 000 FEET

540 000 FEET

(Joins sheet 61)

(Joins sheet 62)

(Joins inset)

SALUDA

Creek

RIVER

ANDERSON COUNTY

GREENVILLE COUNTY

LAURENS COUNTY

Princeton

Cb PcE PcF CeD CeC CeB CdC2 CdB2 CIC2 CIB2 PdD2 PfE3 Wd ApB LuD MdC2 McD

1 Mile 5 000 Feet

Scale 1:20 000

1/4 1/2 3/4 1

0 1 000 2 000 3 000 4 000 5 000

(Joins upper right)

Wd 1 614 000 FEET (Joins sheet 62)

552 000 FEET

548 000 FEET

1 618 000 FEET

Ca LuF CO

4000 AND 5000-FOOT GRID TICKS

1 610 000 FEET